Amateur Radio

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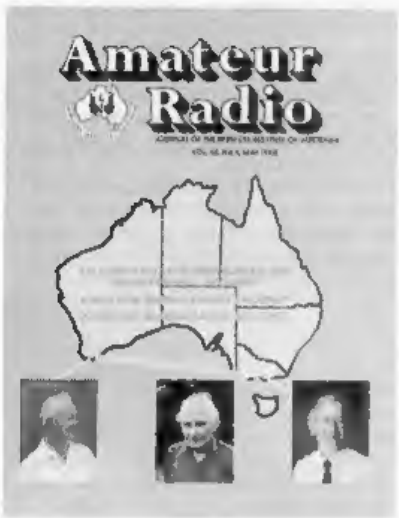

Wally VK6WG.

Lee VK3ZBJ.

Roly VK3KXW.

Photographs courtesy of Brian Green for Wally VK6WG

Photographs courtesy of Barrie Bunning for Roly VK3KXW and Lee VK3ZBJ

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All copy for inclusion in the July 1988 issue of Amateur Radio, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9 am, May 23, 1988.

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Editor's Comment

BACK TO THE TREADMILL

Yes, I am afraid it does seem rather like a treadmill, this business of getting out a magazine each month. Maybe more so for some than others. As editor, I get it easier than the producers, for example. All I have to do is to find something of interest to write a "Comment" on, sort out a few spelling errors or mixed-up statements in a few articles, make sure none of the letters to *Over to You!* is likely to provoke a libel suit, or even cause extreme displeasure, write four or five replies a month to letters which can't be published, write several more to people who have asked for information, make a few dozen phone calls, answer a few dozen more. . .etc. The salary is zero, and the rest of the time is my own! Except that this month the annual Publications Committee report must be written.

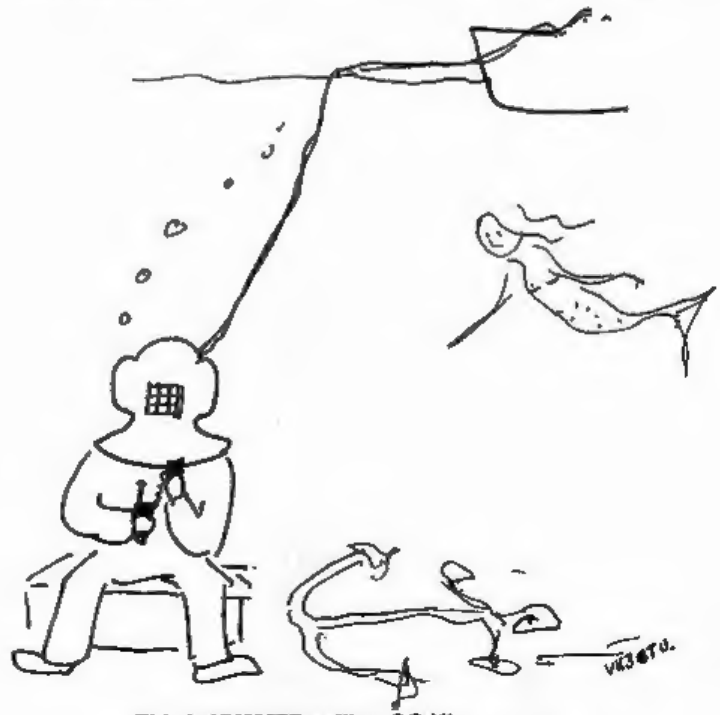
No, I'm not really as disgruntled as I sound, even though I forgot to mention in that lot the commitment to three nights out of every month, one to chair the Publications meeting and two Executive meetings at which mostly I need only sit and listen.

Why do I do it? Why do all the other Executive members spend so much of their time, unpaid, working for the WIA? Because we are convinced that without strong representative national organisations in every country with more than a handful of amateurs, the hobby of amateur radio would shortly cease to exist. That conviction is shared by all those committee members, Divisional councillors, magazine contributors and all those who work for the benefit of the hobby without expectation of reward. Paradoxically, we tend to spend so much time on these activities that we have very little left to actually get on the air ourselves!

So why not hand our various responsibilities over to someone else? I personally would love to find a suitable successor. So also would the acting Federal Treasurer, and most of the Executive, not excluding the President! The problem is that suitable people are not much more plentiful than the proverbial hens' teeth! They must be willing to pay for the use of their plentiful spare time, not to be paid for it. Rare creatures indeed!

And if these rare and dedicated creatures are unable to do quickly all those things that you, the members, expect of them, what then? Believe me, if you can find someone else, or some other way, to do it better for less, then snap them up! If they can do it better for more, are you willing to pay more? Almost certainly the Institute's efficiency could be increased by structural changes. By the time you read this, the 1988 Federal Convention may have introduced such changes. It will be interesting to see how it all evolves, perhaps bringing about a leaner, stronger, more efficient organisation. We can afford nothing less!

Bill Rice AX3ABP



This is VK3MER calling CQ YL. . .
—VK3BTU

BRUCE REGINALD MANN VK3BM

The Life Story of an Old Timer

Titanic *sparks a young lad's interest in radio!*

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

AS A SIX-YEAR-OLD, Bruce heard of the rescue of about 700 survivors from the *SS Titanic* in 1912 after she struck an Atlantic iceberg on her maiden voyage.

Bruce, now in his 81st year, reminiscing about the early days said, "My first knowledge of wireless was the rescue of the *Titanic* — the tremendous part wireless played.

"In a couple of years I started making little models, electric bells and using rejuvenated discarded telephone batteries."

His father and uncle were pioneers in opening up Victoria's north-west wheatbelt. Bruce lived on his father's farm at Quambatook and the Mann's became the biggest independent wheat producer in Victoria at that time. By chance, a young city fellow, interested in having his own farm, got work on the Mann property for the experience in 1919 and brought a home-made crystal set with him. He thought the wireless would help fill in the idle hours by listening to ship-to-shore coastal stations, but working six days a week from daylight to dusk left him little spare time.

After a few month, the young man said: "Bruce, you had better take this wireless and get your dad to put up an antenna and see what you can hear."

In Easter 1920, his father, James Mann, erected two 60 foot poles 300 feet apart with a 20 foot lead-in and a three wire flat-top antenna.

"I started getting the spark Morse signal from all the capital cities and ships from Townsville to Perth.

There was a magazine called *Sea Land and Air* which published all of the regular transmissions of the coastal stations — I could identify them that way."

His father encouraged him and later went to Melbourne to buy a wireless, some books, a key and buzzer. A city retailer told Mr Mann (snr) that by adding a valve to the wireless, signals could

be heard from America — but to get a valve you had to obtain a Navy permit by passing a 12 words-per-minute Morse test.

A local stationmaster trained Bruce up to the required speed in about 10 days, and with his declaration of proficiency, he was granted a Navy permit in 1921.

Bruce has held the call sign VK3BM since 1937 — before that his experimental licence was 3CK (no prefix).

Although having obtained a Navy permit earlier to buy a valve, and being certified at 12 words-per-minute, he was later required to pass the code test again. He recalls visiting the Melbourne radio inspectors office on March 9, 1937, and persuading them to give him a test on the spot. Then there was the rush down the street to get a "shilling in the slot" picture from the photograph machine.

Bruce remembers that, when his certificate was issued, it was suggested he could have a call sign with his initials — VK3BM. He baulked at the idea because Howard Kingsley Love, well-known radio amateur and long serving WIA president, had had the call sign for nine years. The radio inspector said: "He's just tossed it (call sign) in." Bruce believed Howard surrendered the call through "pressure from the missus".

After the then mandatory six months operating CW, Bruce moved on to telephony. During 1938, while his father and mother were travelling overseas, he lowered the two 60-foot masts and joined them into one 121 foot mast. DX heard his signal loud and strong being radiated by a big V-beam. The VK3BM signal from Quambatook was renowned.

During his parent's overseas trip, Bruce was able to line-up stations in the UK and USA so they could chat with him via amateur radio. But the conversations, which included talk of business and management matters relating to the Mann's farm, were drawn to the attention of the radio inspectors in November 1938. Bruce was given a reprimand, told that there was a maximum fine of £1000 or one year in jail, for discussing commercial matters over amateur radio. After signing a "confession" and agreeing to do his best to prevent a repeat of the infringement, no further action was taken.

Four years later, when Darwin was bombed during World War II, a car load of radio inspectors arrived at the Mann farm seeking Bruce's help. It was agreed that, should the enemy invade Australia and destroy military communication installations, the Quambatook set-up would be activated. Bruce was earlier asked to keep radio receivers in the area working so locals could hear news broadcasts.

"I also had an official request to listen to German propaganda broadcasts and report periodically on that. Their musical programs were superb, and some of the propaganda was very well done," he said.

After the war, VK3BM was reactivated with his booming signal being heard overseas long after Radio Australia had faded out.

In April 1964, Bruce made a break-through by achieving the first ever telephony contact with the USA on the 160-metre band which had been released to the Amateur Service two years earlier. Using a 136 foot high vertical with 16 radials of 126 feet each, an historic contact with signals at strength four was made with Dale Hopper W6VSS, in La Cresenta, near Los Angeles.

SCHOOL DAYS

Bruce was educated at Melbourne's Scotch College, graduating with honours in science and mathematics, and founded the college's radio club in 1923, being the first secretary. (As mentioned earlier, Bruce had obtained his 3CK experimental licence in 1922).

After entering Scotch, he soon became acquainted with four or five other boarders interested in wireless, and a day-boy, Keith Ballantyne (later VK3AKB), who wore a WIA badge. Keith proposed Bruce for WIA membership, and the pair were friends for more than 60 years.

Bruce recalls that the proper use of feed-back regeneration to boost receiver sensitivity and selectivity was "being suppressed in magazines through pressure from the military because it could interfere with their communications." However, at Scotch, the finer points of regeneration were quickly learned and applied.

The Post Master General's (PMG) Department had taken over control of wireless from the Navy, and there was discussion about the possibility of broadcasting stations, a medium which existed in the USA and being experimented with in Europe.

Then came exciting news that the Australectric Company in Little Collins Street, Melbourne, had imported a Marconi Telephone Transmitter from England.

Experimental two hour music transmissions were scheduled on Monday nights — the first such regular programs in Australia.

"I was just bursting to get home for the May term holidays to see if I could hear it at Quambatook.

We were all keyed up to hear if we could get the music on a Monday evening. Sharp at 8 o'clock there it was, loud and clear in two sets of headphones " Bruce vividly remembers.

Bruce's father heard the announcer say that he would appreciate telephone calls or written reports from people hearing the broadcast at a distance.

"I have a call from Mr Mann, 200 miles away at Quambatook in the Mallee. The greatest distance from which we have previously been reported is Seymour — 50 miles," the announcer told his audience.

The Mann family enjoyed another wireless music concert before the holidays ended.

Back at college, on telling his mates of the broadcast, they pleaded with him to rig-up a wireless set. Buying another valve out of his pocket money, a big coil of copper wire was obtained to make an antenna between school buildings, and a large six volt accumulator was borrowed from the practical physics laboratory.

At 8 o'clock the music began. Soon all 18 boarders were eager to hear the broadcast, but could not fit in Bruce's small bedroom, however they managed to get an ear to six earpieces! The music was soon shattered by the voice of the college's principal, Bill Littlejohn, who shouted: "Where is everybody?"

The senior prefect, who had been among the 18 boys, raced to him and said: "Mann has got a wireless going up in his bedroom and we are listening to the concert." Mr Littlejohn was given a complete headphone to listen, and overcome by the excitement, summoned his wife.

The principal, a senior science master, later encouraged Bruce to begin the Scotch College Wireless Club by setting aside two rooms on an upper floor with a flag pole handy to support an antenna. Initial response saw about 40 members join the club which affiliated with the WIA. The school provided some money for books and equipment, and weekly meetings were held.

Bruce remained the club's secretary until he left the school at the end of 1924 — and still occasionally has contacts with Scotch College under its call sign, VK3ACQ.

BACK TO FARM VIA EUROPE

After completing school he declined a position at University and offers of employment in the new radio industry — deciding to return to Quambatook and work in partnership with his father.

But, before becoming a farmer, his father saw a circular looking for senior college boys to join a Young Australian League seven month tour of Europe. Seeing the wonderful opportunity for Bruce to widen his horizons, Mr Mann encouraged his son to set off on the adventure of a lifetime which included 30 days at sea, each way.

Bruce says he had a very interesting visit to London University during the tour. There in a corner of the electronics laboratory was Doctor Fleming, then an Emeritus Professor, inventor of the thermionic valve.

"He retired from the professorship a tired old man, but they just left him in his old age to play around in his laboratory, because he was the man who invented the wireless valve and was a world authority on electricity."

Bruce had some of Fleming's books, and the pair chattered for half an hour, with the professor very eager to know what was happening with wireless in Australia.

On returning to Quambatook, tractors were becoming suitable for wheat farms. The honours student applied his knowledge to greatly increase production and reduce manpower by engineering some farm machinery.

His radio set had grown to five valves, with a loud speaker giving out the news and weather forecasts — the era of radio broadcasting had arrived.

There was no thought of getting a transmitting licence then because his experimental licence had lapsed while overseas and re-sitting the examinations did not appeal.

Bruce became interested in improving the quality of music being received, and all types of experiments were carried out — including the development of push-pull direct-coupled audio. A great friend and founder of the Rola Company in Australia, Len Webb, would send Bruce a prototype speaker for test, and offered any production speaker at factory price. The Mann experiments also led to improvements in the arm tracking of gramophone pick-ups.

Another friend, Murray Orr VK3OR (SK), who was leader of a jazz band, and his mother, who had been a concert pianist, heard the music Bruce was reproducing and got very excited about it. Murray told his friends on the air how good the music sounded off the gramophone records.

There was no holding a car load of Melbourne amateurs, including Max Howden VK3BQ (SK), from travelling to Quambatook to listen in person.

HEARING PROBLEM

Bruce has had a life-time interest in audio and music — a pursuit he followed despite having a serious hearing problem. The industrial deafness was caused by driving noisy high-powered tractors with no silencer nor cabin for many years.

The problem is, at 1 kHz and above, his hearing is down 60 dB. For his amateur radio activity he has done much research and used numerous speakers to cut the bass and emphasise the high tones. He built a graphic equaliser from a kit and modified it to achieve a suitable level of balance for his hearing difficulty. It is only in the last 17 years that he has used a hearing aid with compensation.

In 1962, Bruce approached a top hearing consultant in Philadelphia who said there was nothing that could be done for his hearing

problem. Bruce suggested a hearing aid with compensation but this was dismissed because of the high development cost. Using valves, Bruce built up an electronic compensation for his hearing which made a great difference. He sent a report on his findings to the Philadelphian specialist who thanked him but made no further comment.

About four years later, a traveller from the company of Angus and Coote arrived at Quambatook seeking out Bruce and giving him a prototype Swiss-made hearing aid. The only obligation was a full technical report from him after three months of use.

"They picked me out to see whether to put it into production obviously," Bruce said.

"It revolutionised my family life and public affairs." (Earlier he had been forced to relinquish the position of secretary with several organisations as he could not hear to write the minutes).

Since the first model delivered by the Angus and Coote traveller, Bruce has tested four advanced models of compensated hearing aids.

A classical music buff, Bruce enjoys listening to music and his interest has progressed from electric pick-ups to the latest Compact Disc (CD) technology.

STILL ENJOYS AMATEUR RADIO

Bruce has regular scheds on 20 metres with friends in England and into the USA on 40 metres. He doesn't call CQ anymore, but rather enjoys keeping his regular scheds.

His 30-metre tall mast and beams at his Swan Hill QTH, where he and wife Margaret retired to in 1971, is a local landmark.

The experimenter also operates via amateur satellite with a motorised antenna array of his own design.

Bruce was founding president of the Swan Hill and District Radio Club. Commenting on amateur radio in the later 1980s, Bruce said: "At my age the problem is that most of my life-long friends have gone — gone on.

"When you put put a good signal, the trouble is that all the young squirts want your card."

The modern-day on air amateur radio has "so little technical talk — the tendency is to all get into groups and pass it around quickly.

"I'm too old and slow-witted to keep up with that — the hearing doesn't help either."

ar

TOPICAL TECHNICALITIES — 4

Lindsay Lawless VK3ANJ
Box 112, Lakes Entrance, Vic. 3909

If effective length of an aerial is known it is possible to measure the field strength of an incident wave in volts per metre.

Continuing the discussion about aerial absorption cross section, it is interesting to look at some of the implications of the concept of area as a measure of aerial effectiveness.

What are the dimensions of an aerial absorption cross section? The absorption cross section of a dipole is $0.13\lambda^2$ and if the length of the element is one dimension the other is 0.26λ and the area is $\lambda/2$ by $\lambda/4$. Carrying that idea a stage further, it is probably true to say that one dimension is always parallel to the electric field. This leads to another measure of a receiving aerial's effectiveness which is more useful to amateurs — 'effective height' or 'effective length'. If the effective length of an aerial is known it is possible to measure the field strength of an incident wave in volts per metre.

The power extracted by a receiving aerial is:

$$P_r = (Eh)^2/R_t$$

E is the field strength in volts/metre
h is the effective length of the aerial
R_t is the total resistance of the aerial and

$$R_t = R_r + R_a + R_l$$

R_r is the radiation resistance
R_a is the absorption (receiver) resistance and
R_l is the loss resistance.

If R_l is comparatively small and ignored, maximum absorption will occur when the aerial is matched to the receiver by making $R_r = R_a = R_t/2$ then,

$$P_r = (Eh)^2/2R_t$$

.....(1)

and the power absorbed $P_a = (Eh)^2/4R_a$

.....(2)

and the power re-radiated is $P_r = (Eh)^2/4R_a$

Figure 1(a) — Uniform Current Distribution.
h = l

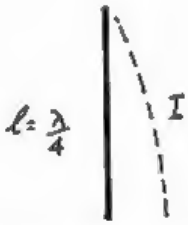


Figure 1(b) — Sinusoidal Current Distribution.
I average = 2I/π
h = 2I/π = λ/2π

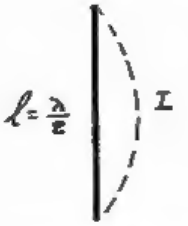


Figure 1(c) — Sinsuidal Current Distribution.
I average = 2I/π
h = 2I/π = λ/π

The actual length of an aerial equals h only if the current distribution is uniform along its length (Figure 1(a)). Practically, the current distribution on a straight wire or rod element is a portion of a sine wave (Figure 1(b) and 1(c)) and the effective current is the distribution average. The average of the distribution in both a quarter wave and halfwave aerial is (2/¶)I where I is the maximum value. The effective lengths of those examples is therefore 2/¶ times the actual length

$$h_{0.25} = \lambda/2¶$$

.....(4)

and $h_{0.5} = \lambda/¶$

.....(5)

Comparing the power absorbed by those examples:

$$P_{a0.25} = (E\lambda)^2/16¶^2\ R_{a0.25}\text{ and}$$

$$P_{a0.5} = (E\lambda)^2/4¶^2\ R_{a0.5}$$

$$R_{a0.5} = 2R_{a0.25}$$

therefore a halfwave aerial will absorb twice that absorbed by a quarter wave aerial.

The important practical application of the above theory is:

$$P_a = V^2/R_a \text{ for a matched aerial}$$

.....(6)

V = the volts at the matched receiver input therefore:

$$E = 2¶V/\lambda \text{ for a halfwave aerial and —}$$

.....(7)

$$E = \sqrt{8} = 2.8¶V/\lambda \text{ for a quarter wave aerial.}$$

.....(8)

Measure V and calculate E. How do you measure V? Borrow a good signal generator and calibrate the S-meters of the stations receivers. Remember that most receivers are matched to halfwave dipoles or 50 ohm feeders.

ar

TO MULTIPLEX OR PERPLEX

Some simple experiments leading to a better understanding of multiplexing.

Jack Heath VK2DVH
2 Barclay Street, Quakers Hill, NSW. 2763

A single digit seven segment display would require eight lines, seven for segments a to g, plus one common return. See Figure 1.

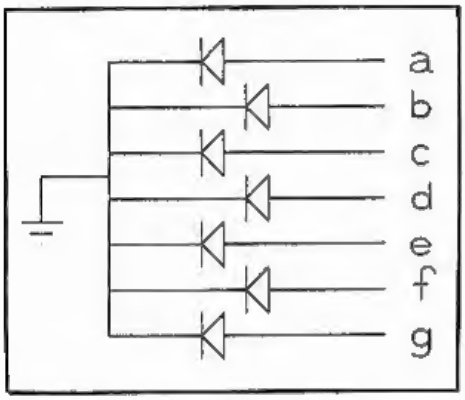


Figure 1.

Three digits would require 24 lines and so on. There is a simpler and more economical way of achieving this. If we take a three digit display and join all the a segments together, b together, and c together, etc, we would get the result shown in Figure 2.

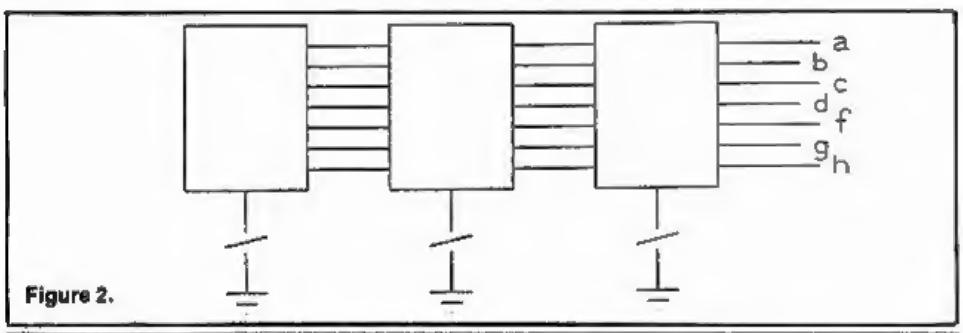


Figure 2.

Note that each digit common cathode line is taken to earth via a switch. If we apply a positive voltage (two volts approximately) to say segment a, it will not light until one of the digits cathode switches is closed, we now have a choice of which digit can be lit.

We can replace the mechanical switch with a solid state switch such as a transistor, see Figure 3.

By applying a positive voltage to any of the bases we can enable (switch) that particular digit and by means of a selector switch we can enable any segment we want to light.

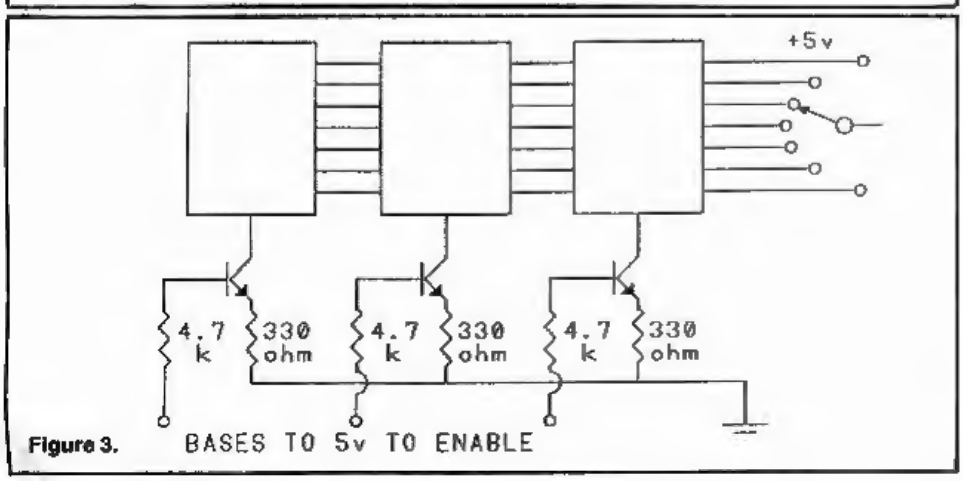


Figure 3.

Going a step further we can replace the switch that goes to the bases of the transistors with an IC type 4017, which is a divide by 10, but for our particular purpose we will use only three of its outputs, (of the available 10) as a stepping switch. (See Figure 4).

By applying a positive going pulse (how this is achieved will be described later) to the input of the 4017 we can activate each of the three inputs sequentially. So, now we have a solid state sequential switch activating digits and a mechanical switch for segments.

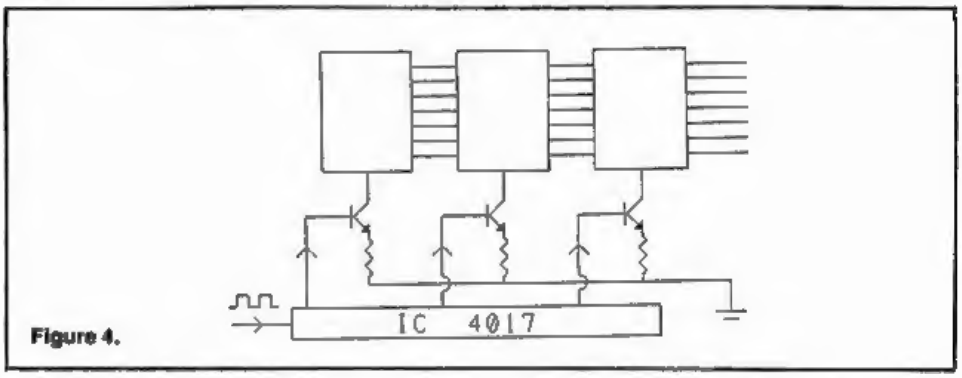


Figure 4.

For our pulse generator we will use a 555 IC connected as shown in Figure 5.

A seven segment mechanical switch is rather cumbersome and not of much use, so a second 4017 is used as a segment enabling switch activated by the same IC so it will step in unison with the first 4017.

So far we have a three digit display with two stepping switches and little else (Figure 6).

Supposing you want to display the word LES (the use of numerals has been avoided). Outline of line one, IC3 I would connect three diodes to segments d, e and f forming the letter L.

Out of line two, IC3 connect five diodes to segments a, f, e, d and g, forming the letter E.

Out of line three, IC3 connect five diodes to segments a, f, g, c and d, forming the letter S.

As both 4017 ICs are driven by the same 555 they will step in unison, so the first digit will display the letter L, the second digit the letter E and the third digit the letter S.

Figure 7 shows the complete circuit.

The circuit in Figure 7 will spell out LES and keep repeating itself. For a permanent display, the clock frequency can be increased.

The display used here had twelve digits already connected for multiplexing of which we could use 10 digits the number of drives available from the 4017. The display cost 75 cents.

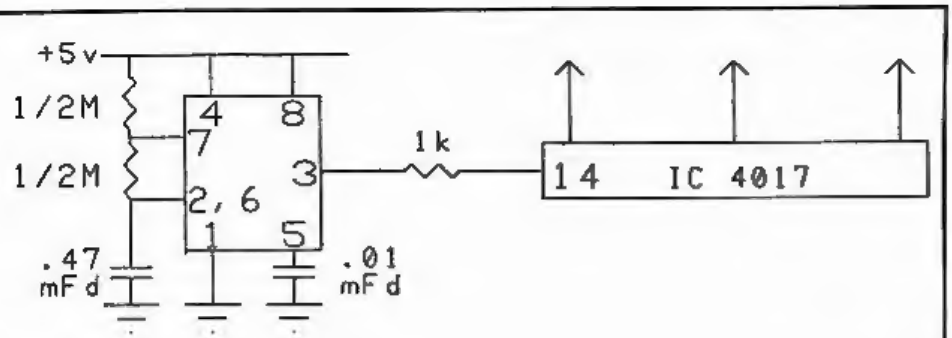


Figure 5.

NOTE: Some 555 ICs will not work at five volts although the ones used here worked as low as three and a half volts.

POWER SOURCE

If four penlight cells are used it is necessary to connect two diodes in series to drop the voltage to approximately five volts (see Figure 8).

All inquiries to the above address. Please enclose an SAE for reply.

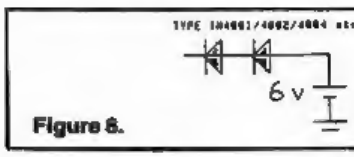


Figure 8.

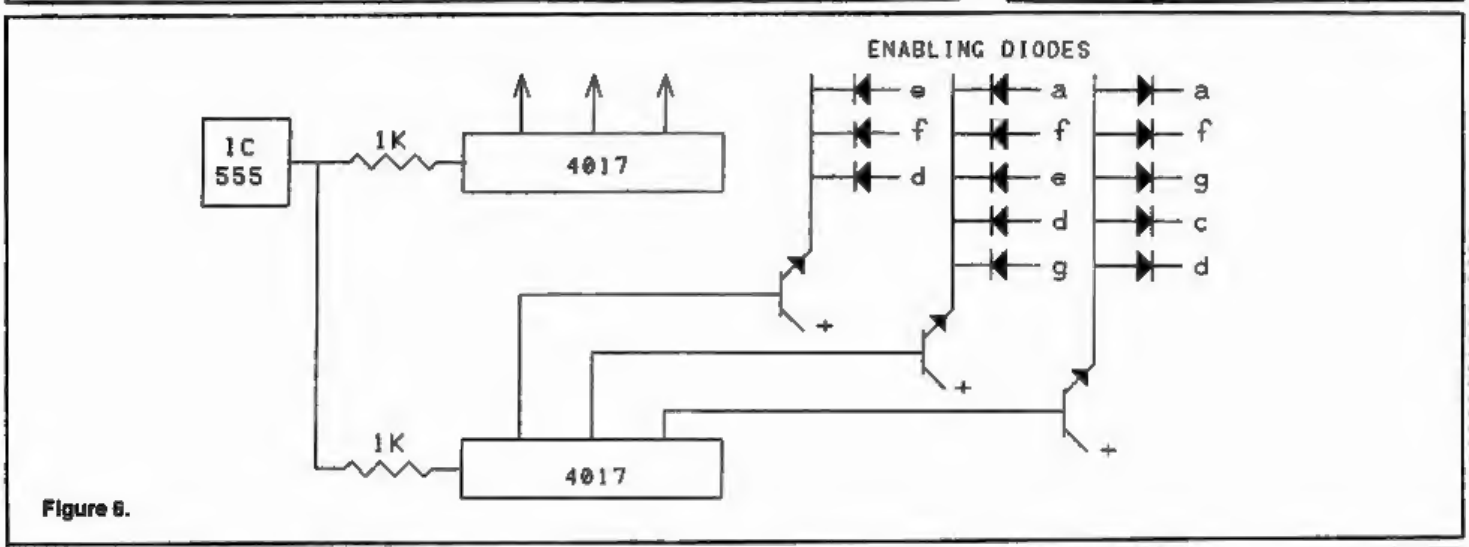


Figure 6.

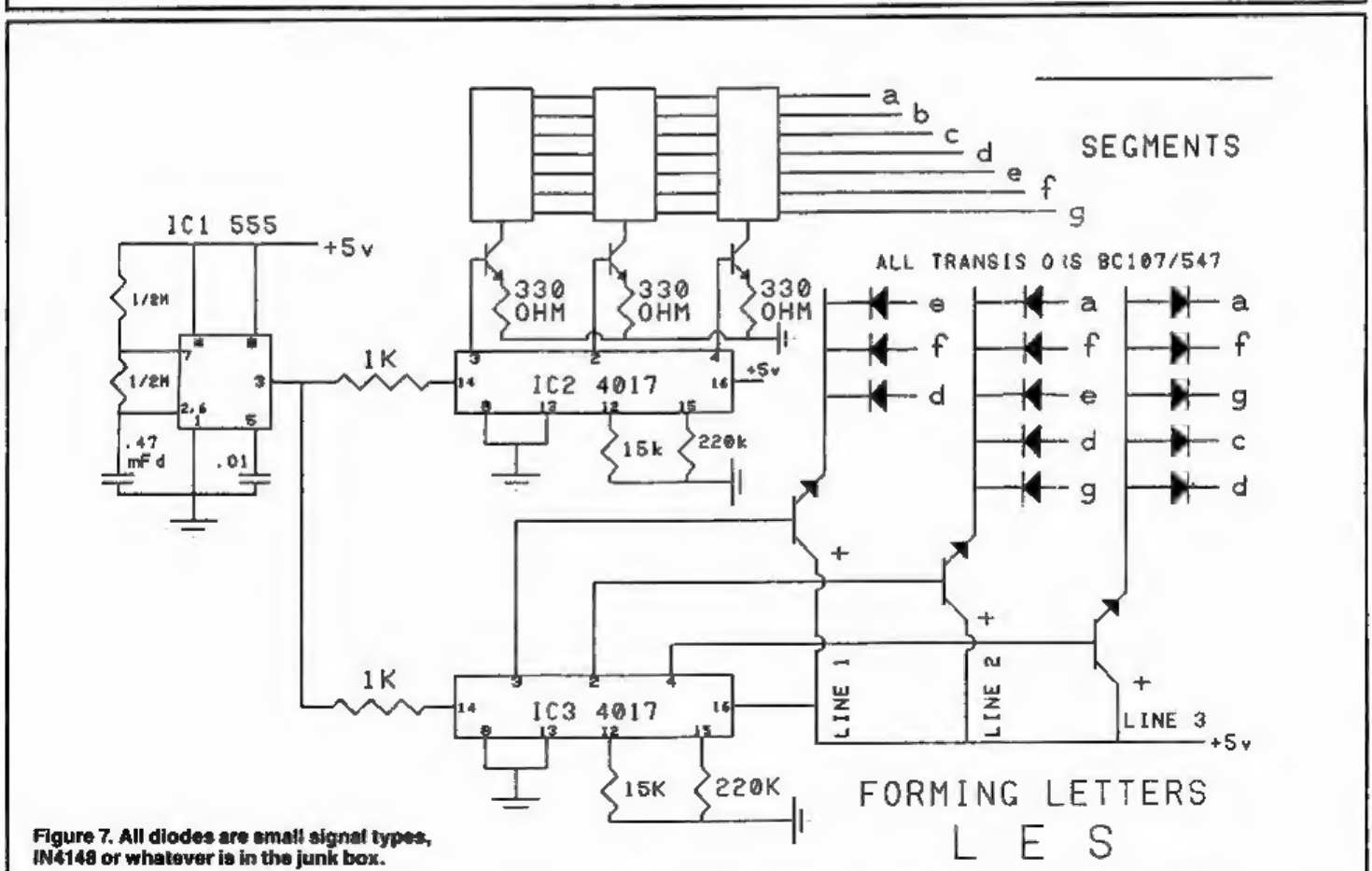


Figure 7. All diodes are small signal types, IN4148 or whatever is in the junk box.

TANK CIRCUITS & OUTPUT COUPLING

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The output tuning and coupling of the final RF amplifier is an important part of the transmitter.

IT IS DESIGNED to load the amplifier for optimum power output with a minimum of harmonic content. Here are a few notes on its design.

INTRODUCTION

To obtain high efficiency, final RF power amplifiers for single sideband operation are normally operated in Class AB or Class B and those for CW or FM operated in Class C.

In coupling a tuned RF power amplifier to its load (the antenna or antenna feed line), two requirements must be satisfied:

1. The correct load resistance, which will enable the amplifier to deliver its rated power, must be presented to its output.
2. The loaded Q factor must be carefully selected. Plate current in a class AB, B, or C amplifier does not flow for the complete period of an AC cycle and the waveform is maintained by the inertia of the tuned circuit. Too low a Q causes waveform distortion and increased generation of harmonics. As Q is increased, circulating current in the tank circuit is also increased and if made too high, it causes excessive IR power loss in the circuit. A loaded Q of 12 is considered optimum although values between four and 20 might have to be tolerated over the tuning range of a multi-band amplifier.

RF amplifiers can also be operated in a wideband or untuned mode and for this method of operation, a low pass filter is required in the output circuit to reduce harmonics generated by the waveform distortion.

In the following paragraphs, a simple design procedure will be discussed for the tuned amplifier and the wideband untuned amplifier in turn.

LOAD RESISTANCE

For valve RF power amplifiers operating at power levels suitable for amateur use, load resistances (RL) in the region of 1000 to 7000 ohms are typical. The *ARRL Handbook* provides the following approximation for valve RF amplifiers:

$$\text{Class A RL} = \frac{Eb}{1.3Ib}$$

$$\text{Class B RL} = \frac{Eb}{1.5IB}$$

$$\text{Class C RL} = \frac{Eb}{2Ib}$$

where Eb = Plate voltage
and Ib = Plate current (Amps)

For the valve power amplifier, the required load resistance is normally much higher than the transmission line impedance (typically 50 ohms). By comparison, the transistor power amplifier requires a load much lower than the transmission line impedance. Neglecting bottoming voltage, the load resistance of a single ended transistor amplifier is calculated from the following:

$$RL = \frac{Ebb^2}{2Po} \quad \ldots a$$

where Ebb = Supply voltage
and Po = Power output (watts)

For a 13.5 volt supply and output powers between 10 and 100 watts, RL varies between 9.5 and 0.7 ohms.

There could be some confusion in applying the expressions to sideband transmission where both the power output and plate current swings with speech modulation. In this case, Po should be taken as the maximum RMS power delivered, or PEP power and plate current should be taken as peak DC current swing.

BASIC TANK CIRCUIT

To set the required loaded Q factor in the basic coupling circuit of Figure 1a, the tuning capacitor and inductor in the tank circuit must be selected for the correct reactance at the frequency of operation. Reactances (XC and XL) are calculated as follows:

$$XL = XC = \frac{RL}{Q}$$

where Q = loaded Q (say 12)

Capacitance and inductance are calculated then using the usual formulae:

$$C = \frac{10^6}{2\pi.f.XL} \text{ pF} \quad \ldots b$$

and

$$L = \frac{XL}{2.\pi.f} \text{ uH} \quad \ldots c$$

where f = frequency in MHz

The number of turns on the primary (Np) of T1 is set by the inductance calculated. Where the secondary is tightly coupled to the primary, such as in a multi-filar wound toroidal transformer, the secondary turns (Ns) are calculated as follows:

$$Ns = Np. \frac{RA}{\sqrt{RL}} \quad \ldots d$$

where Ra = Antenna or transmission line load resistance.

When using such a transformer, there is no provision for loading adjustment except for connection of different combinations of multi-filar windings (if such a facility is available). Hence, the antenna circuit must be carefully matched to ensure that the selected value of Ra (say 50 ohms) is presented to the transformer secondary.

With an air wound coupling transformer, the coupling coefficient is lower and more secondary turns than that given by the previous formula, are required. The degree of

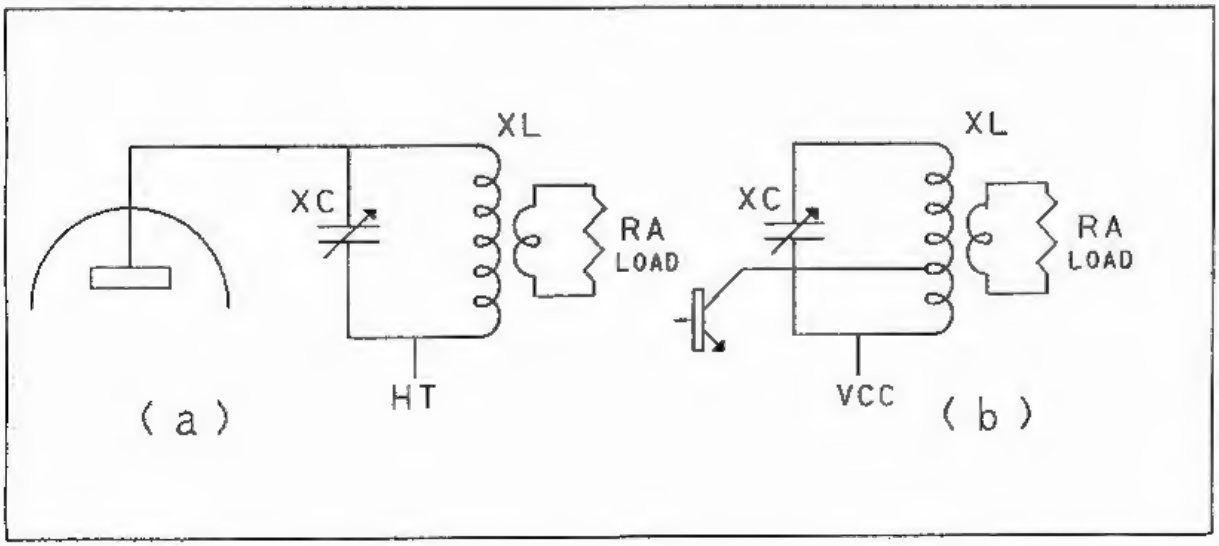


Figure 1: Basic Tank Circuit.

coupling can be adjusted by either taps on the coils or by varying the spacing between primary and secondary. Adjustment is usually carried out by initially resonating the tank circuit with the secondary loosely coupled and then gradually increasing coupling and re-resonating until the rated loaded power amplifier current is achieved.

Resonance is indicated by a pronounced dip in plate (or collector) current. If the off-resonance current is too low to achieve the rated loaded current when dipped, the amplifier may have insufficient input drive power. A variable tuning capacitor is usually fitted in the tank circuit and a tuning procedure could be to initially set the capacitor value near that calculated to give the correct loaded Q, then adjust the indicator taps for near resonance and finally fine tune with the capacitor.

The circuit of Figure 1a, as it stands, is somewhat impractical for transistor use. Suppose RL = 1 ohm and Q = 12, then XC = 12 ohms and at 1.8 MHz we would need the somewhat large capacitance of 7400 pico-farads. The situation can be improved by tapping down the collector connection on the inductor as shown in Figure 1b. If a tap were selected at a quarter of the turns, the 12 ohms would be increased by a factor of four squared giving a value of XC = 192 and a capacitance at 1.8 MHz of only 460 pico-farads.

THE PI COUPLER

The Pi coupling network (Figure 2) is a suitable coupling system where it is necessary to reflect, to the output of a power amplifier, a high resistance load from a lower impedance transmission line. It is ideal for coupling a valve power amplifier normally requiring a high resistance load to a low impedance line.

To examine this network in more detail, we divide the network into

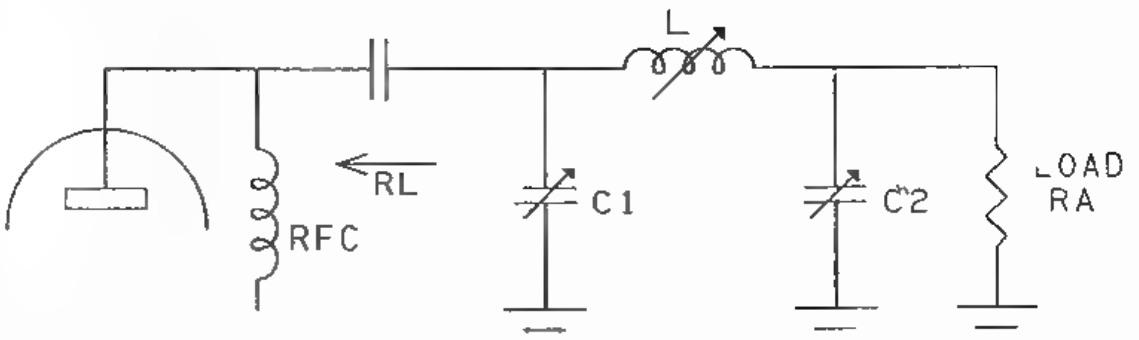


Figure 2: PI Coupling Network.

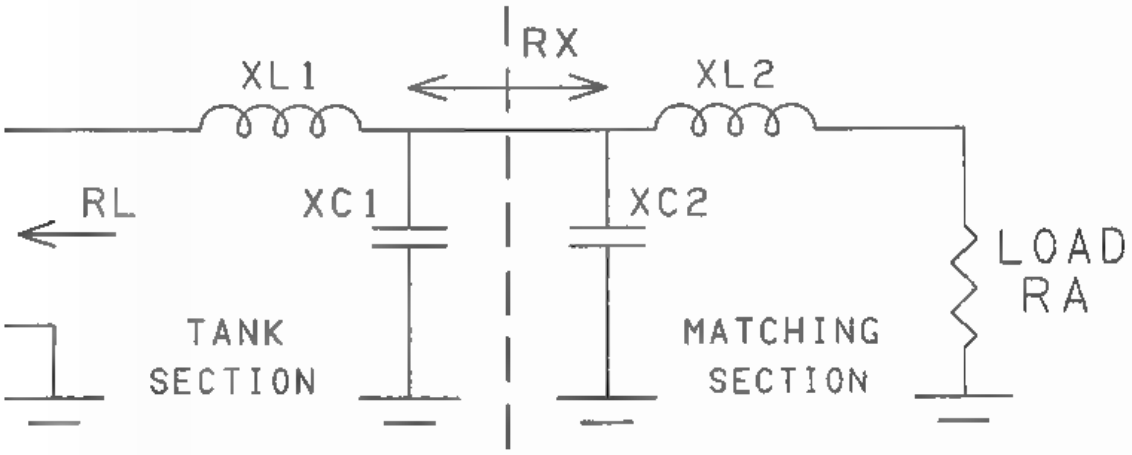


Figure 3: PI Network split into two sections for analysis.

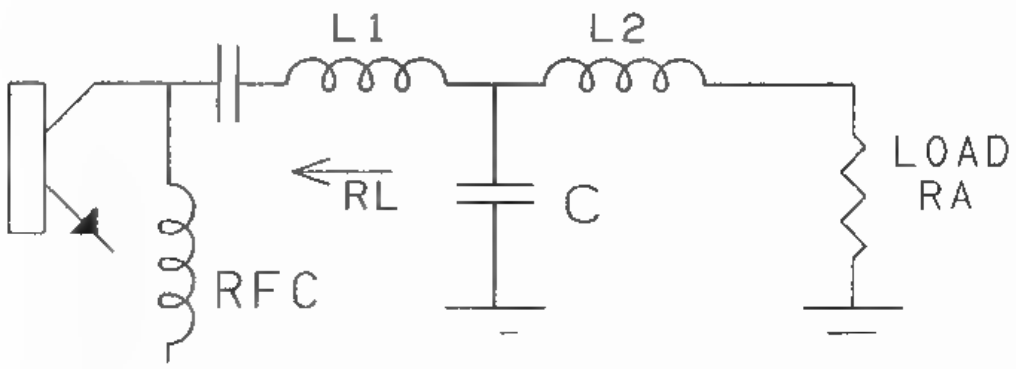


Figure 4: 'T' Coupling Network.

two sections (Figure 3), splitting the inductor (L) into two parts, L1 and L2. The first section can be considered to be the tank circuit which sets the correct value of loaded Q. To reflect the correct value of RL to the amplifier output, a resistance value of Rx must be presented at the tank circuit output. The two reactive components and Rx, are calculated as follows:

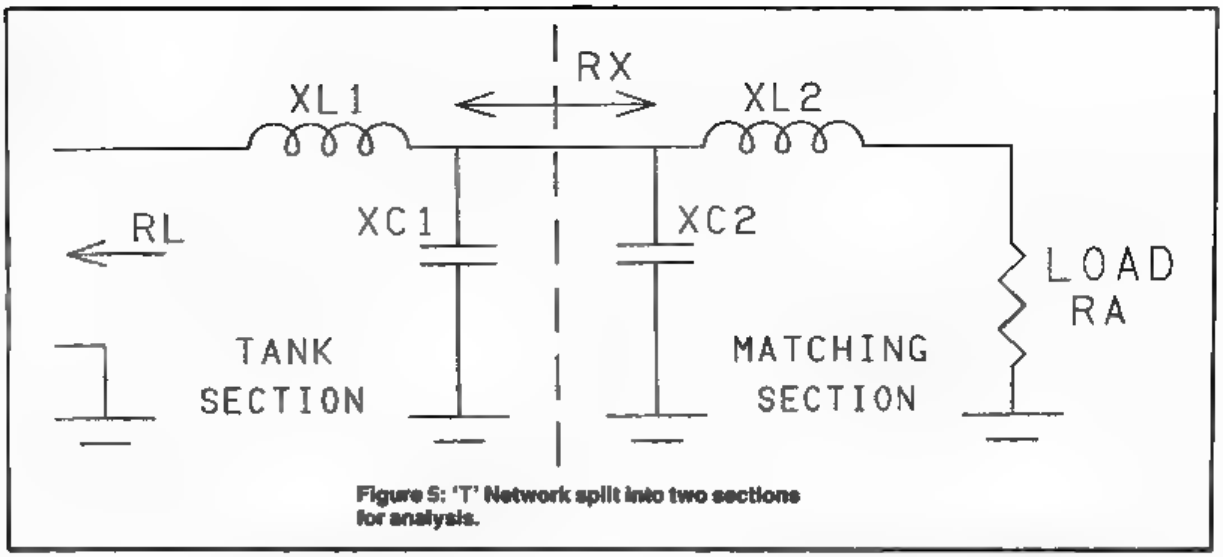


Figure 5: 'T' Network split into two sections for analysis.

$$XL1 = \frac{RL}{Q}$$

$$XC1 = \frac{XL1}{RL}$$

$$RX = \frac{}{Q^2 + 1}$$

where Q = loaded Q (say 12)

The value of Rx is normally lower than 50 ohms and the purpose of the second section is to match this resistance to the transmission line impedance (Ra). Making use of formulae described in references 1 and 2, we calculate the reactive components in the second section as follows:

$$XC2 = \sqrt{\frac{RX RA^2}{RA - Rx}}$$

$$XL2 = \frac{XC2 \cdot RA^2}{RA^2 + XC2^2}$$

Putting the two sections together, a single inductive reactance (XL) is formed by the sum of XL1 and XL2. The components L1, C1 and C2 are calculated from their reactances, as before, from the formulae b and c.

The Pi coupling system is often considered desirable because its formation makes up a low pass filter which attenuates the harmonic components.

In the preceding discussion, the transmission line load has been considered as resistive, however, the three components in the network are normally made adjustable and can be used to also correct for reactance in the line load.

A tuning method for the Pi coupler is suggested as follows:

1. Preset the inductor near its desired value (hopefully set for a suitable loaded Q).
2. With C2 set for maximum value, resonate the plate circuit using C1.
3. Increase the loading gradually, by decreasing C2, until the rated input power is reached. (For each change of C2, reset resonance with C1).

THE T NETWORK

For the transistor RF power amplifier, where the amplifier load (RL) is low compared to the transmission line impedance, the T network (Figure 4) is more suitable.

Again we split the network into a tank section and a matching section with capacitor C split into two parts C1 and C2 (refer Figure 5). In this case, Rx is made greater than RL and calculation, for the tank section, is as follows:

$$XL1 = RL.Q$$

$$XC1 = XL1$$

$$Rx = RL.(Q^2 + 1)$$

For the transistor power amplifier, Rx also works out greater than Ra and, in the matching section, we again use the formulae from references 1 and 2, to calculate the reactive components as follows:

$$XL2 = \sqrt{(RX - RA)RA}$$

$$XC2 = XL2 + RA^2/XL2$$

Putting the two sections together, the reactance (XC) of capacitor C, is the parallel result of XC1 and XC2, ie

$$XC = \frac{XC.XC2}{XC1 + XC2}$$

The components L1, L2 and C are calculated from their reactances, as before, from the formulae b and c.

As stated earlier, the load resistance (RL) for a transistor is normally quite low and certainly less than the transmission line impedance (typically 50 ohms). Using power MosFET transistors, the supply voltage is often much higher than that used with bipolar transistors and for low power stages of the MosFET type, the load resistance might turn out to be greater than 50 ohms. For this case the Pi network might be more suitable than the T network. To make the decision, work out the value of RL first. If RL is greater than the line impedance, use the Pi network. If it is less than the line impedance, use the T network.

UNTUNED OR BROADBAND AMPLIFIER

Instead of using a tank circuit, transistor RF power amplifiers of today are often coupled to the antenna transmission line via untuned broadband transformers. Harmonics of the operational frequency components are reduced by feeding the output via a low pass filter which has a cut off frequency some 20 to 30 percent above the operating frequency (refer Figure 6).

If the amplifier is to work in a linear mode for single sideband operation and a high efficiency is to be achieved, it must work in class AB or class B where amplifier current flows for less than the whole AC cycle. In the opinion of the writer, a broadband linear RF amplifier, operating in class AB or class B, should be given the same design considerations as a similar class of audio amplifier, that is, it should operate push-pull to maintain continuity of amplifier current flow for the whole AC cycle. (It is a different case to the single ended tuned amplifier which has the inertia provided by a tank circuit to maintain a good waveform).

Notwithstanding what has been said in the previous paragraph, circuits are published for single ended broadband linear amplifiers which rely on a following low pass filter to remove the harmonic components generated. However, in these, one must question the level of additional components, within the filter passband, which might be generated by intermodulation between the various sideband components passing through the amplifier. Another point is that second harmonic components are those nearest to the fundamental frequency and the least attenuated by the slope of the low pass filter. Push pull operation helps by balancing out these particular harmonics.

A few words can be said about the load resistance of a push pull transistor amplifier. Formula a, previously given, is for a single ended stage. If the amplifier works push pull class B, each transistor works on half a cycle and the load resistance across one half of the output transformer should be the same as formula a. The load resistance (Rcc) across the complete winding is four times this, ie:

$$Rcc = \frac{2Ebb^2}{Po}$$

For push pull class A, each transistor shares half the power over the full cycle and each should see a load resistance, at its own half of the transformer primary, twice that of formula a. The load resistance across the complete wind is four times that of the half wind, ie:

$$Rcc = \frac{4Ebb^2}{Po}$$

For class AB, one must judge whether operation is closest to class A or class B.

The coupling transformer should be tightly coupled with multi-filar type windings and a ferrite core. The primary reactance, at the lowest operating frequency, should be a number of times larger than the primary load resistance (RL). Turns ratio (T) is calculated from:

$$T = \sqrt{\frac{RA}{RL}}$$

The design of the low pass filter can take many forms depending on the type of filter ad

ripple specified in the passband. The following is presented for the design of a 50 ohm 0.1 dB ripple Chebychev filter as applied in Figure 6:

$$L1, L2 = \frac{12.38}{fc} \text{ uH}$$

$$C1, C3 = \frac{4142}{fc} \text{ pF}$$

$$C2 = \frac{7134}{fc} \text{ pF}$$

where fc = the cutoff frequency in MHz

With fc 25 percent above the operating frequency, the filter should attenuate the second harmonic of the operating frequency by about 35 dB and the third harmonic by about 55 dB. To achieve a satisfactory filter response, aim for a high loss resistance such is found in ceramic capacitors.

SUMMARY

Design procedures for various methods of coupling RF power amplifiers to the transmission line have been described. Coupling systems described are divided into those which are tuned and those which are untuned and broadband.

For the tuned systems, you may choose to use a simple tuned tank circuit or take advantage of the harmonic reducing characteristics of the Pi or T network. Where the transmission line impedance is less than the load impedance required to be reflected to the amplifier (such as for the value amplifier), use the Pi network. Where it is greater (such as with the transistor amplifier), use the T network.

For the untuned wideband system using an RF power amplifier operating in class AB, B, or C, a low pass filter must be included to reduce harmonics radiated.

1 LLOYD BUTLER, VK5BR. *Loading up on 1.8 MHz*. Amateur Radio *December 1985*.
2. LLOYD BUTLER, VK5BR. *An Approach to Antenna Tuning*. Amateur Radio *June 1987*

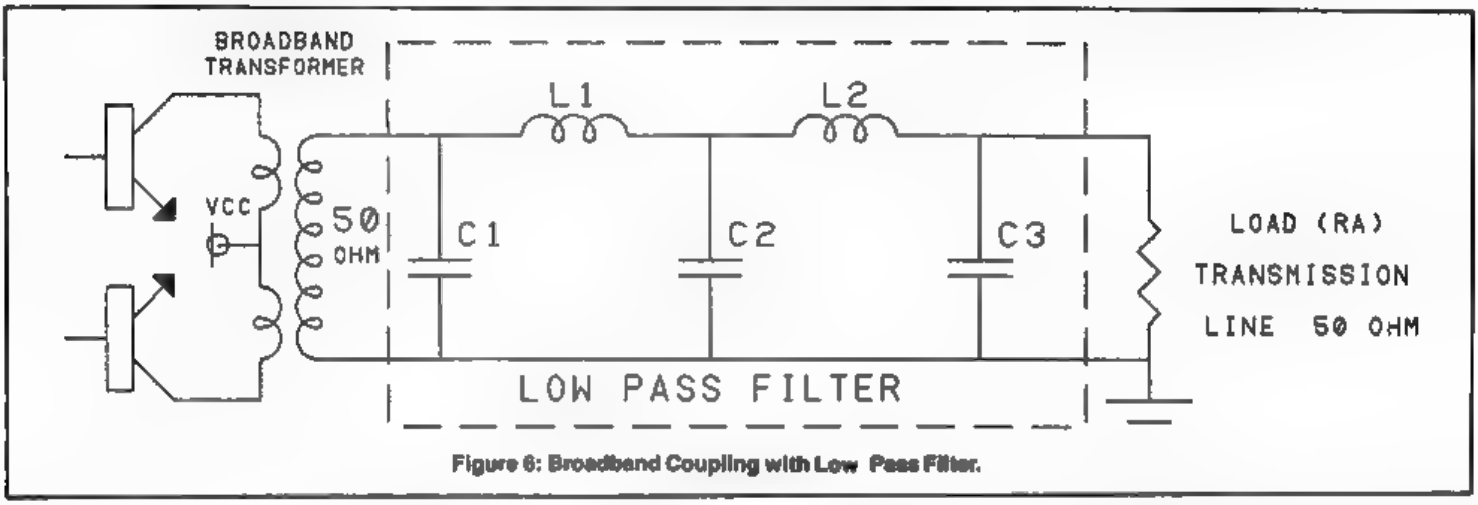
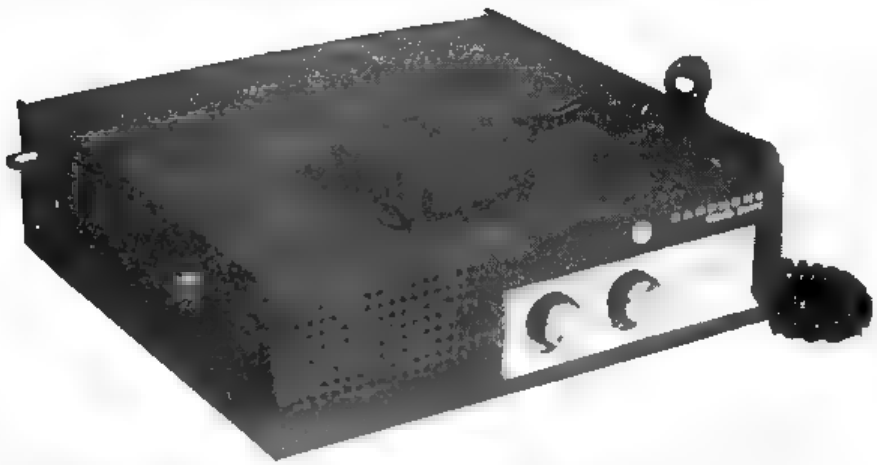


Figure 6: Broadband Coupling with Low Pass Filter.

CONVERSION OF THE AWA 25M TO SIX METRES FM

Ian Keenan VK3AYK
6 Pretoria Street, Caulfield South, Vic. 3162

The AWA 25M/21 is a low band (70 to 85 MHz) solid state 25 watt mobile radio which made its appearance in the early 1970s.



The 25M/21 is constructed on four major circuit boards; receiver, transmit exciter audio and preamplifier board. The receiver has a 10.7 MHz first IF followed by a 455 kHz second IF. The transmitter is phase modulated and, by a process of three tripler stages, obtains the carrier frequency.

MODIFICATIONS

1. RECEIVER

The 25M receiver, in my opinion, was not the most sensitive for its time so, in this case, it is not prudent to merely pad the front end coils with capacitance to make them tune the six metre band without further degrading its capabilities. Instead, the coils should be rewound. NOTE: The wire sizes for this are the same as the original. All rewound coils should be spaced to occupy two thirds of the receiver coil formers.

Carefully remove the receiver circuit board, taking note of all wiring connections to the board. Note that all coil formers on the receiver have a base. The coil cans have two flaps, one on each side of the can. By using a small instrument screwdriver, these can be bent out from the underside of the base allowing the can to be removed without the need to remove the whole assembly from the circuit board.

Locate can TR1 (front end coil) and rewind the secondary with eight turns. The primary should be increased to two turns interwound with the secondary at the bottom of the coil. Change C1 from 18 pF to 22 pF. Locate L1, observe the direction of winding, then rewind it with eight turns tapped at 6.5 and 4 turns from the bottom. Change C6 to a 22 pF capacitor. L2 is rewound with eight turns tapped at 4.5 and 1.75 turns from the bottom.

C8 remains unchanged at 22 pF. Finally comes the question of the receiver front end filter. This can be omitted if liked, however I retained it as it does add additional front end selectivity. L1 and L3 of the filter should be rewound with eight turns tapped at 2.5 turns from the bottom. C3 and C6 are replaced by 47 pF capacitors. L2 is rewound with eight turns tapped 1.5 turns from the bottom. C5 is change to a 33 pF capacitor. There are no alterations to the multiplier stages as injection is now on the high side of the signal.

The receive crystal is calculated as follows:

Receive Crystal Frequency = Fc + 10.7/2
Hence for 52.525 MHz:
= 52.525 + 10.7/2
= 31612.500 kHz (K-style)

2. TRANSMITTER

The transmitter originally used three tripler stages to obtain the operating frequency. In this case, the last tripler (VT7) is changed to a doubler. Locate L6 and solder a 30 pF ceramic capacitor across the under side of the coil (copper side). This then is in parallel with C51 which is located inside can L6. Remove C55 and replace it with a 56 pF capacitor. Turning now to the PA board, remove L1 and rewind it with 18 turns of 26 gauge insulated wire. L4 is rewound with five turns, L8 with four turns, both close wound. Finally, L11 is rewound with six turns, the length of the coil is expanded to about 18 millimetres in length. I found that it was not necessary to alter the low pass filter which is located behind the aerial connector.

The transmitter crystal is calculated as follows:

Transmitter Crystal Frequency = Fc/18
Hence for 52.525 MHz:
= 52.525/18
= 2916.055 kHz (D-style)

ALIGNMENT

1. RECEIVER

Insert the receive crystal into the socket, connect the meter between TP1 (+VE) and TP2 (-VE) on the receiver board. Adjust TR2 and L3 for maximum and then readjust TR2 for a peak. Note this figure and then wind the slug of TR2 in until 80 percent of the original indication is obtained. This will be around 36 microamps. Then adjust TR3 for a minimum reading around 14 microamps. Apply a signal at the carrier frequency to the aerial socket. Adjust L2, L1, TR1, L4, and L5 for a maximum meter reading. The meter, in this case, is connected between TP17 (+VE) and TP18 (+VE) on the 2.5 volt range. Gradually reduce the input level as the front end is brought into alignment. Tune L1, L2 and L3 of the receiver input filter for maximum reading on the meter. Finally, net the receiver from a known accurate source. With a meter connected across TP13 and TP14 adjust crystal netting capacitor C101 for a zero reading on the meter. If you are able to check the quieting it should be about 20 dB for 0.8 microvolts input or if you are lucky, better!

2. TRANSMITTER

Connect a sensitive power indicator (50 ohms) to socket SKA of the exciter. Insert the crystal into the socket, connect the meter between TP13 (-VE) and TP14 (+VE) on the exciter board. Key on he tansmitter and adjust TR1 for maximum and L3 for minimum, then adjust L2 for 80 percent of a peak (around 28 microamps). Transfer meter -VE to TP16 and tune TR1, L3 and TR2 for maximum. Adjust L4 for minimum (around 45 microamps). Transfer the meter to TP15, and adjust L4 and TR3 for a maximum reading, then tune L6 and L7 for maximum into the sensitive RF indicator. Power should be between about 25 to 60 mW out of the exciter. Disconnect the low power indicator and restore SKA to the power amplifier board and connect a power meter to the aerial socket.

CAUTION

When tuning capacitors on the PA board the transmitter should only be keyed on for short periods. This will prevent damage as these stages will be off-tune. Connect the meter to TP4 (+VE) and TP3 (-VE) on the PA board. Tune C2 for maximum and transfer the meter to TP5 and tune C8 for maximum. Then, move the meter back to TP3 and tune C2 and C3 for maximum. As soon as power is indicated on the power meter adjust C19, C18, C14, and C15 for maximum/output power. Then, repeat above again including C8 and C13. If more than 25 watts is obtained, reduce the capacity of C14 slightly, also readjust C15. It will be found that some capacitors peak and do no cause a corresponding drop off in power as tuned further on. These should be tuned to the initial maximum and not taken any further otherwise excessive current may be drawn resulting in possible damage to a power transistor. Remove the transmitter crystal with the transmitter keyed on and ensure the RF output falls to zero. With a frequency counter net the transmitter by adjusting C101. Finally, check the deviation for 5 kHz or this can be done with another station for an adequate audio level without distortion.

Converting ex-commercial sets is an inexpensive way of getting on air. They may not have all the modes and whistles — but they don't have the same price! So, don't leave it in the garage for the next 20 years — have a go!

—Photograph courtesy Bill Trenwith VK3ATW

TOPICAL TECHNICALITIES — 5

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That theory cannot be found in any of the popular amateur text books is neglecting a very important subject.

A recent decision to install a desk microphone to replace the assorted microphones hanging by their coiled cords from the various appliances on my operating table revealed the fact that very little information about this subject is available to the average amateur

Manufacturers brag about the frequency response of their microphone and readily supply an estimate of impedance but they are usually very cagey about microphone 'Pressure Response' (or sensitivity).

When a sensitivity rating is supplied it will be in one of four ways which the prospective purchaser has to interpret to decide whether or not the microphone will drive the modulating stages of the rig. The following sensitivity specification for four different models are typical:

'Pressure Response' at 1000 Hz.
Mic (a) -73 dB
Mic (b) -53 dB
Mic (c) 2.2 mV/Pa
Mic (d) 0.22 mV/μbar

Would you believe that those four sensitivity ratings are exactly the same? They are and it is necessary to retrieve some basic theory to find a practical meaning. That theory can't be found in any of the popular amateur text books which is neglecting a very important subject.

Microphone (c) deserves first consideration because the manufacturer has changed to SI units. Why others haven't done so baffles me — SI units are as essential for good modern engineering as round wheels! A pressure response of 2.2 mV/Pa means that the microphone will produce 2.2 milli-volts RMS on open circuit when the RMS sound pressure at 1000 Hz at the diaphragm is one Pascal. If the microphone amplifier matches the microphone impedance the input to the amplifier will be 1.1 mV for the same pressure. Our search for a practical use for that information continues.

An RMS sound pressure of one Pascal is a 'Sound Pressure Level' (SPL) of 94 dB above a reference pressure level of 2×10^{-5} Pascal which is recognised as the lowest sound level that can be detected by the human ear. Some call it the threshold of audibility.

Conversational speech at a distance of one metre has a SPL of 70 dB, amateur microphones should produce usable output at this level — the sample microphone will produce an open circuit output of 24 dB below 2.2 mV, which is 0.14 mV. 0.07 mV will be available at the input of a matched amplifier. Will this drive the modulating stages of all your appliances? It does not suit any of mine.

Looking at the other ratings: microphone (d) is the same as (c) because one micro-bar is 0.1 Pa and also one dyne per square centimetre, which leads to a consideration of microphone (a). The pressure response rating used for microphone (a) is still popular unfortunately, particularly with those who like to hide behind esoterics. The reference level for the quoted -73 dB is one volt and therefore it should be written -73 dBV. It means, but neglects to say so, that an RMS sound pressure of one dyne per square centimetre at the microphone diaphragm will produce an open circuit output of 73 dB below one volt which is 0.22 mV

Rating (b) recognises the existence of SI units and is marginally preferable to (a) if you still prefer to be circumlocutory. The reference is one Pascal. Microphone (b) will produce an open circuit output of -53 dBV when the 1000 Hz sound pressure at the diaphragm is one Pascal RMS -53 dBV is 2.2 mV

If you must buy one of those handsome desk microphones for the home station be sure to ask the salesman to quote its pressure response in milli-volts per Pascal. If he can and does, divide his answer by 30 and if the answer is much less than the input required for your rig/s, leave it

Here are some snippets about the same subject.

One Pascal = One Newton per square metre = 10 dynes per square centimetre = 10 μbar

The intensity (i) of a sound wave (in fact any wave) is the average time rate of transfer of energy per unit area of a surface perpendicular to the direction of propagation. The intensity is proportional to the square of the RMS pressure,

$$I = P^2/pv \text{ watts per square metre}$$

P is the RMS excess pressure in Pascal
p is the density in kilograms per cubic metre
v is the velocity in metres per second

For air the product pv is approximately 400 at 20 degrees Celsius.

The intensity of the threshold of audibility is approximately 10^{-12} watts per square metre

Don't worry if you discover that you can't hear 10^{-12} watts per square metre; you are probably one of the 95 percent who can't

ar

POSTCODE CONTEST — a WIA NSW Division Initiative

The old adage "use it or lose it" has traditionally been used in reference to our bands which are under pressure from other spectrum users. From time to time, efforts are made to encourage activity on bands which appear to be little used, and therefore could be difficult to defend if commercial interests seek them

In Victoria, the lower part of two metres has had scrambles (mini-contests) to promote SSB operation. The WIA had, one on occasion, encouraged activity on the bands gained by the Amateur Radio Service at the World Administration Radio Conference (WARC) in 1979.

Now, the WIA NSW Division has gone one step better with the introduction last November of a contest on the last Friday of every month aimed at promoting simplex operation using voice-mode.

The contests (see list below) involve 10, six and two metres, 70 centimetres, and microwaves. They have become known as the "Postcode Contests" since an integral part of the report exchange are the postcodes of the participants.

Novices can join in the fun by taking part in the 10 metre contest. That band is virtually deserted at night and it has long been held that 28 MHz should take some of the across-town contacts using the often congested 80 metre band.

At the other end of the spectrum, contest activity is available for those experimenting in the microwave bands which will be sought after as expanding technology increases applications for information distribution systems.

The Postcode Contests are held between 9 pm and 11 pm Sydney-time on the last Friday of the month. The report consists of a serial number from 001, and the postcode of each contestant. The final score is the number of distinct participants worked, multiplied by the number of distinct postcodes — electronic calculators are permitted to be used to tally up the score.

The general rules are voice-mode (FM or SSB as appropriate), from a single transmitter, and rare postcode. Multi-operator stations are permitted, but the call sign of the station itself must be used. All stations in New South Wales are eligible, and, in some cases, a separate category is established for country operators, defined as operation more than 16 kilometres from the official measurement point in Bridge Street, Sydney.

Certificates for first, second and third place-winners are issued for each contest. SWL entries are welcome.

Perhaps other WIA Divisions will follow the NSW Division's example and run their own postcode contests — any volunteers out there to help organise such events? Contact your Divisional Council.

And, why not a national WARC bands postcode contest to promote activity on these bands?

The NSW Division announce contest details on its Sunday Broadcasts. Information sheets are available for each specific contest. Further details are available from the NSW Divisional Office, PO Box 1066, Parramatta, NSW 2150 or by telephoning (02) 689 2417 weekdays between 11 am and 2 pm or on Wednesday nights between 7 and 9 pm.

POSTCODE CONTEST CALENDAR

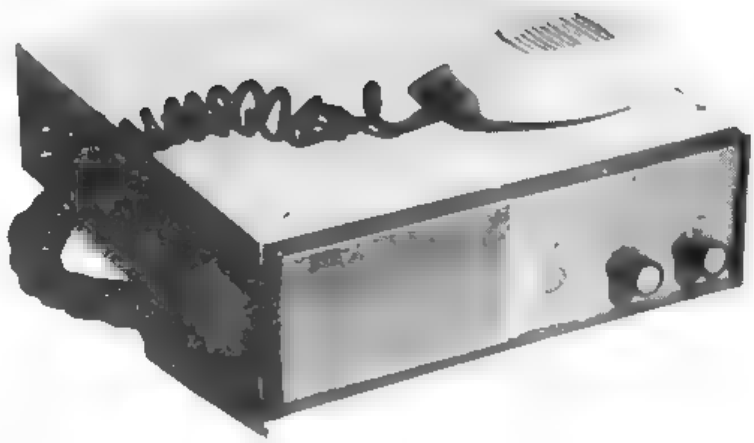
May	Two metre SSB
June	Two metre FM
July	10 metre, microwaves
August	Six metre
September	Two metre FM
October	70 centimetre
November	Two metre SSB

Contributed by Jim Linton VK3PC with acknowledgment to the W.I.A. NSW Division for details

CONVERSION OF THE PHILIPS 1680 to SIX METRES FM

Ian Keenan VK3AYK
6 Pretoria Street, Caulfield South, Vic. 3162

These days, the 1680 is a comparatively old commercial mobile radio. Hence many have found their way onto the disposal market over the years.



THE 1680A/25N,W is a 25 watt low band (70 to 85 MHz) FM transceiver. There is also a 10 watt version, but the higher power one is discussed here. The A/25N is a 30 kHz model, whilst the A/25NW is the older 60 kHz channeling model. The receiver has a 10.7 MHz first IF followed by a 455 kHz IF.

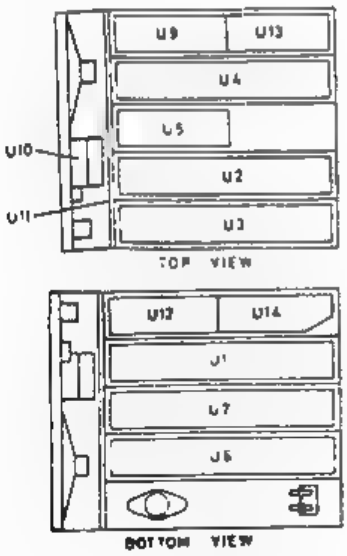


Figure 1: Layout of the various boards.

CONVERSION

Before beginning, give the unit a thorough inspection and ensure it is, as far as possible, in working order. This can save a lot of time and trouble after the modifications have been carried out.

Figure 2.

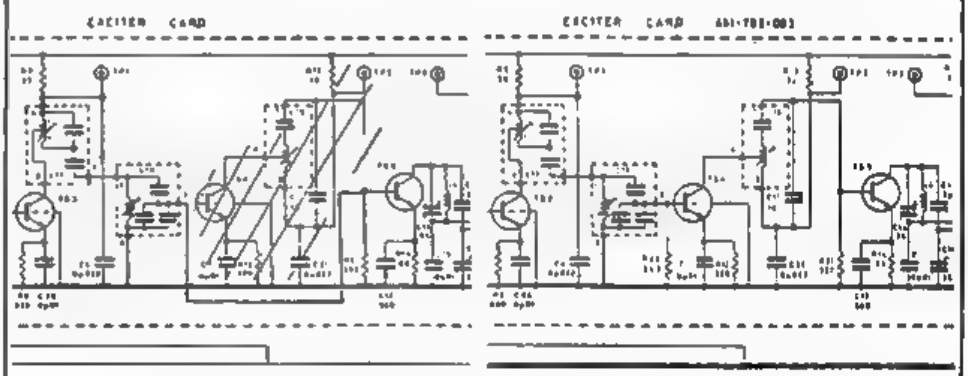


Figure 2 a: Before. **Figure 2 b: After.**

TRANSMITTER

Originally the transmitter crystal was in the range of 8.750 to 10.625 MHz. The oscillator/phase modulator is followed by three doubler stages, ie TS3 x 2, TS4 x 2, and TS5 x 2. The remaining stages are tuned to the operating frequency. To simplify conversion one doubler stage is omitted this being TS4 as per Figure 2.

Remove the exciter board from the unit. Locate transistor TS4 (refer Figure 2 and 3). Cut the track on the circuit board leading out of L18 to the base of TS4. Also, cut the track from L19 leading to the base of TS5. Then join L18 to the base of TS5. (Refer Figure 2). Thus TS4 is now bypassed.

Rewind L6, L7, L11 and L14, each with 13 turns of enamelled copper wire, the same gauge and diameter as was originally used.

Moving to the PA board (refer Figure 4), rewind L3 and L4 with nine turns — same gauge and diameter as the original coils. The old L3 and L4 should be carefully removed as these will be used later.

Next, rewind L9 and L10 with 10 turns of 14 gauge enamelled wire of the same diameter as the originals.

The crystal formula is now:

Transmitter Crystal = F(carrier)/6

Hence for 52.525 MHz

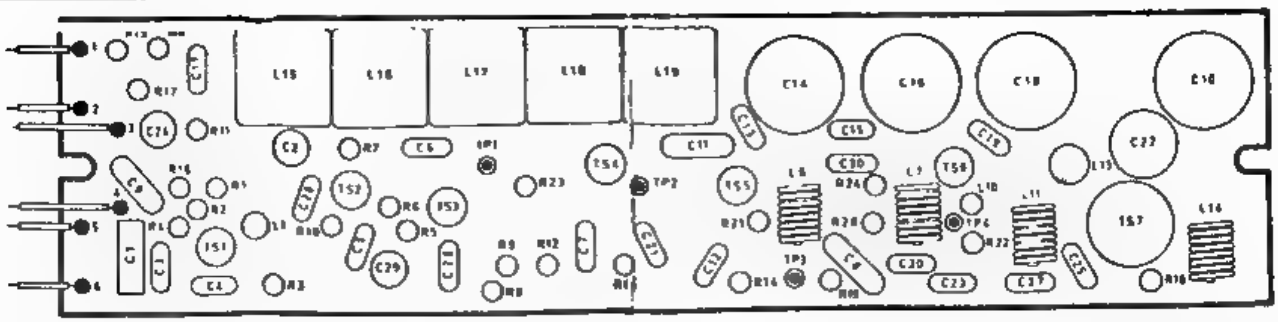


Figure 3. U2 EXCITER CARD 451-782-093

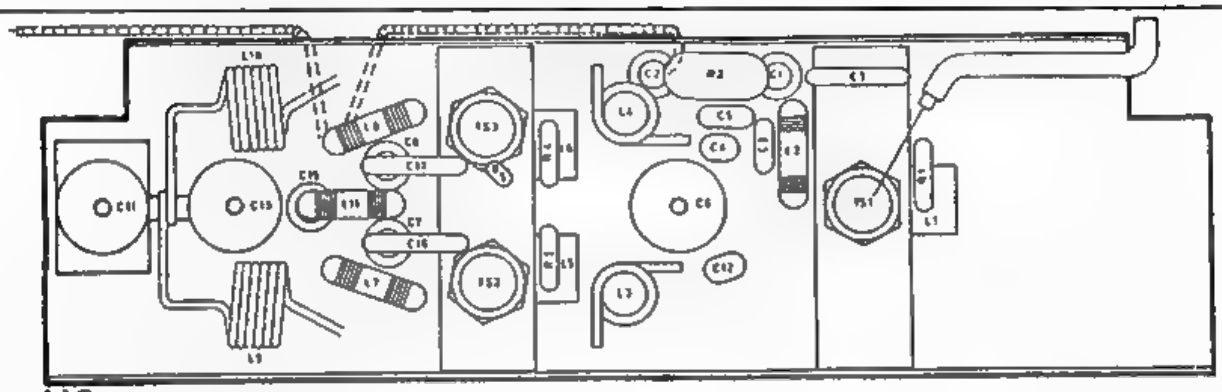


Figure 4. U3 P.A. UNIT 451-782-130, 25 W.

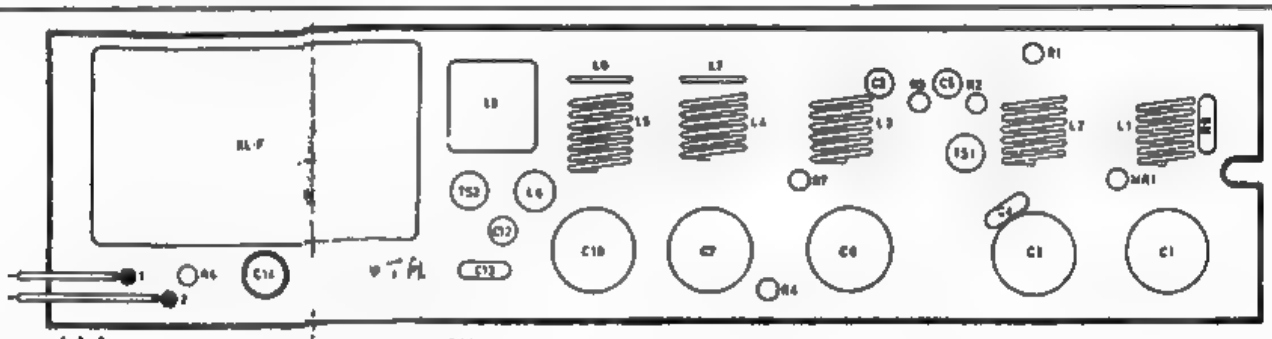


Figure 5. U4 R.F CARD 451-782-135 NW NOTE R8 IS INCLUDED IN R.F

= 52.525 MHz/6
= 8754.166 kHz
Specification 3502-150-0560.2

RECEIVER

Modification of the receiver involves rewinding the front end coils and the local oscillator tuned circuits. (Refer Figure 6).

Rewind L1, L2, L3, L4 and L5 with 10 turns of enamelled wire of the same gauge and diameter as the original coils. L1 should be tapped 1.5 turns from the bottom. L3 is tapped 1.75 turns from the bottom. L7 and L8 (coupled links) should be rewound to 1.75 turns each.

The coils on the local oscillator card. Figure 6, L2 and L3 should be rewound to 14 turns each and L2 is tapped at approximately the halfway point.

The Receiver crystal is calculated as follows:

Receiver Crystal = F(carrier) + 10.7/3

Hence for 52.525 MHz

= 52.525 + 10.7/3

= 21075.000 kHz
Specification 3502-150-0558.2

Finally, the low pass filter has to be modified, refer to Figure 7

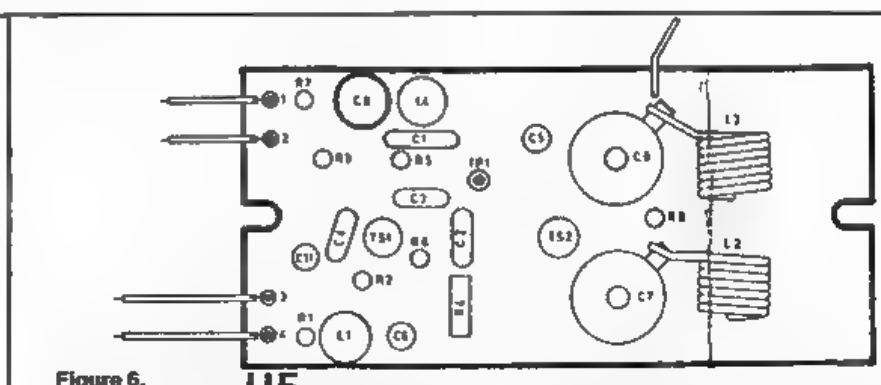


Figure 6. U5 OSCILLATOR CARD 451-782-096

Remove L1 and L2 and replace them with the coils L3 and L4 which were removed from the transmitter driver circuit.

ALIGNMENT

Set capacitors C10, C18, C16 and C14 to two-thirds mesh and C22 to two-thirds mesh. (Refer to Figure 3). Set C6 to minimum capacity, C11 to maximum and C13 to midway (refer Figure 5).

Connect a power meter to the aerial connector and insert the appropriate transmitter crystal into the socket.

a. Connect a multimeter (250 microamp range) +VE to the 11.5 volt rail or board pin 6 and -VE to TP1 (refer Figure 3). Key on the transmitter and adjust L15 and L16 for maximum (about 110 microamps)

b. Transfer the -ve lead to TP3 and adjust L18 and C14 for maximum. TP2 is bypassed due to the earlier modification (about 100 microamps).

c. Transfer the meter lead to TP4 and adjust C16 for maximum (about 70 microamps)

d. Place the multimeter leads across R2 on the PA board (see Figure 4) and tune C10 for

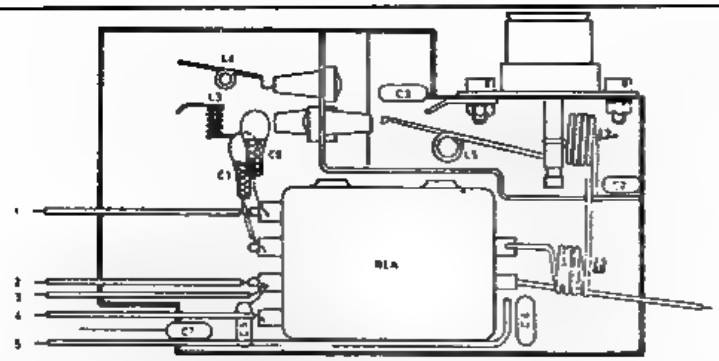


Figure 7. U12 FILTER & RELAY UNIT

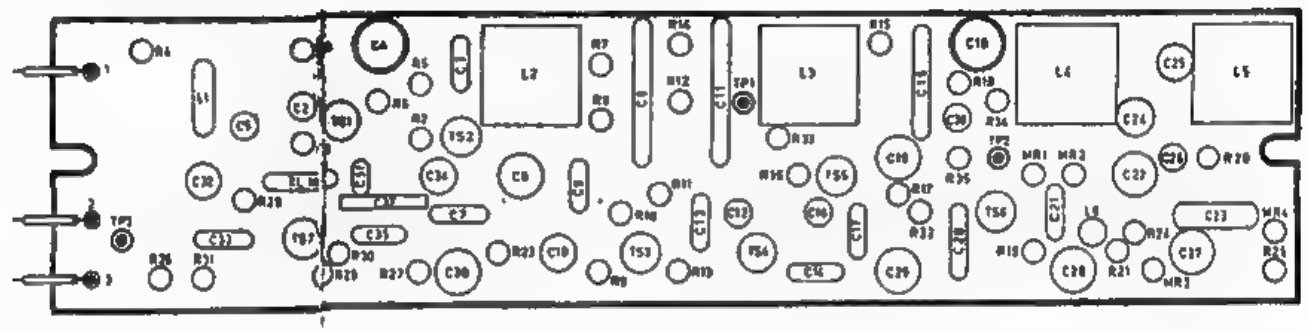


Figure 8. U6 I.F. CARD

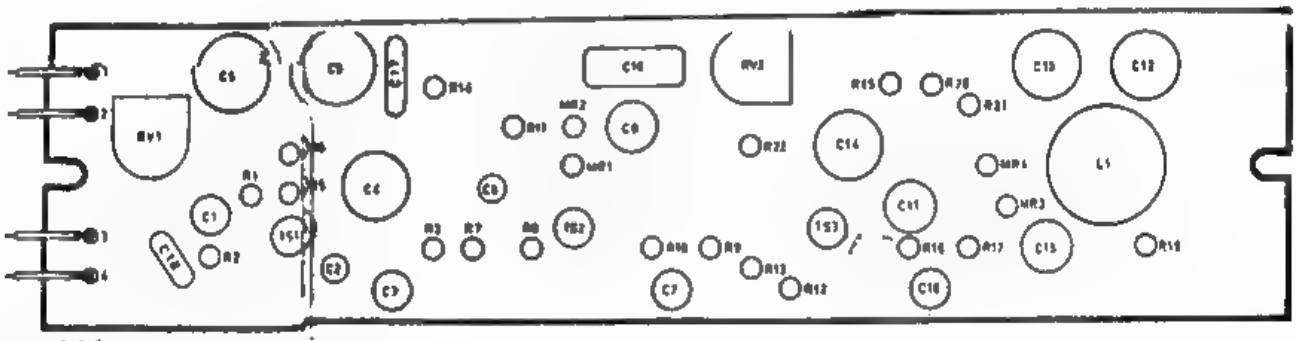


Figure 9. U1 MOD. AMP. CARD

maximum (on the exciter) around 52 microamps.

e. Tune C8 for maximum, into the power meter and, alternatively, tune C11 and C13 for maximum power. Go back and re-peak C18, C22 and C10 until 25 watts is obtained. Remove the transmit crystal whilst the transmitter is keyed on and ensure the output falls to zero.

f. With a frequency counter or on-air test with another station, adjust to the correct frequency (the coil next to the transmit crystal socket).

g. Check that the deviation is around 5 kHz on speech peaks with another station. RV2 is the deviation pot and RV1 is the microphone gain. (See Figure 8).

RECEIVER ALIGNMENT

Plug the receiver crystal into the socket, connect a multimeter on the 10 volt range -VE to TP1 and +VE to the 11.5 volt rail (pin 1 of the local oscillator board, Figure 6). Tune C7 for a minimum reading. Move the meter to the receiver front end board (Figure 5) -VE to TP1 and +VE to pin 2 and adjust the series crystal coil, C7 and C8 on the oscillator board for maximum.

Turn off the set several times and ensure the oscillator restarts. If it doesn't, change C1 from 68 pF to 120 pF and C8 from 12 pF to 68 pF on the oscillator board. Apply a signal at the carrier frequency to the aerial socket, then adjust the front end trimmers, C1, C3, C6, C7 and C10 for maximum receiver sensitivity reducing the signal generator level as required.

When this point has been reached, try moving coupling coils L7 and L8 and repeat above. If the receiver seems slightly deaf, try adjusting the length of the gimmick capacitor between the receiver oscillator board and the front end board mixer circuit. Sensitivity should be about 12 dB SINAD at .5 microvolt (pd) or about .5 microvolt for 20 dB of quieting.

Place the multimeter -VE on pin 2 and positive to TP3 of the IF board (Figure 9). With a *known accurate* frequency applied to the receiver aerial socket, adjust the crystal netting coil for zero volts on the meter.

This whole modification takes about three to four hours. *Hear you on six FM perhaps? ?*

—Photograph courtesy Bill Trenwith VK3ATW

QSP

EME RECORD CLAIM

A new record for EME (moon bounce) has been set by WA4NJP in Georgia, and K6MYC/KH6, Hawaii.

The ARRL says the contact, made on January 5, was the first trans-oceanic EME contact and the ninth ever six-metre EME contact.

Will Australia's pioneer of EME, Ray Naughton VK3ATN, mount a challenge and snatch the world record? At last report, Ray was eager to get six-metre EME operational from his QTH at Birchip.

PACKET CENTURY

Come on packeteers, who among you will be the first to claim a DX Century Club (DXCC) on this mode? Some 122 countries have now been reported on HF amateur bands using packet radio!

GETTING ON AIR — Part 4
An ATU, Antenna and Operating

Peter Parker VK6NNN
C/- Witchcliffe Post Office, WA 6286

A very useful antenna system and ATU.

This antenna is claimed to work on all bands, but so far it has only been tested on 80 metres. It is the famous G5RV as described in AR, December 1982

The ATU is described in AR, June 1986 The coil is wound on a 25 mm former. Insulated wire (plastic coated) is used for the coil with taps every two to three turns. Wire similar to four conductor telephone cable is suitable

Connect the transmitter to the ATU and adjust the tune-up indicator to full sensitivity. Connect the antenna and VC1 to L1. (The writer has found it best if the antenna is two turns from the middle and VC1 16 turns from the middle).

Tune the tune-control and C1 until the meter peaks. Also peak C2. If it is better to short C2 for maximum strength, wind more turns for L2 and re- peak.

Remember to do all of your tuning in the daytime to minimise interference to other operators.

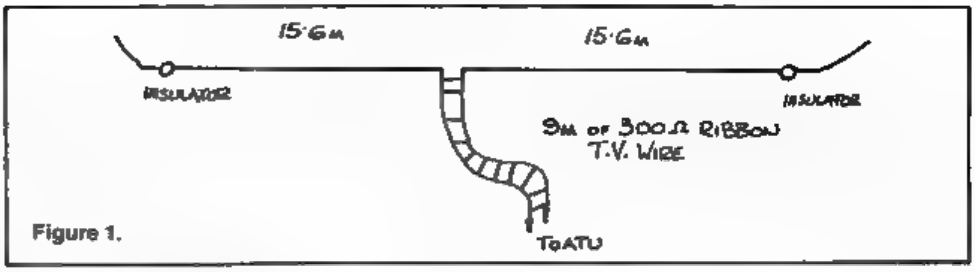
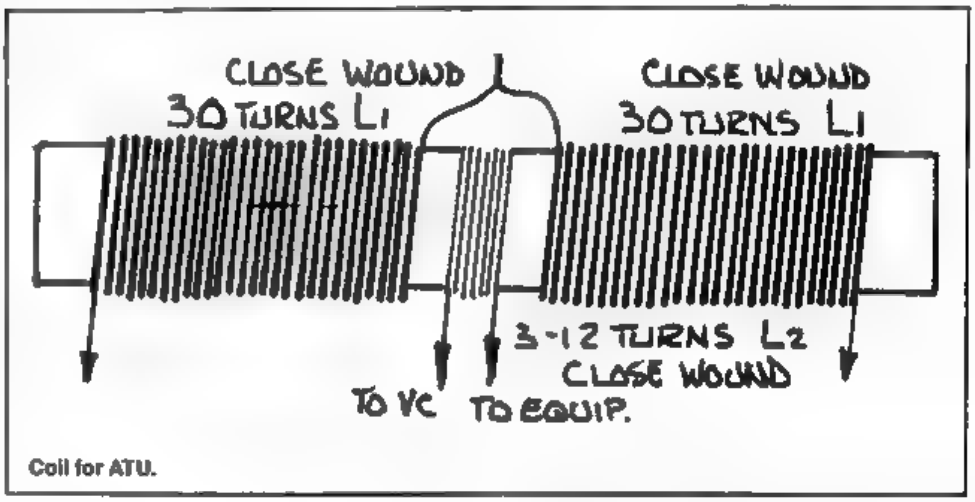


Figure 1.



Coil for ATU.

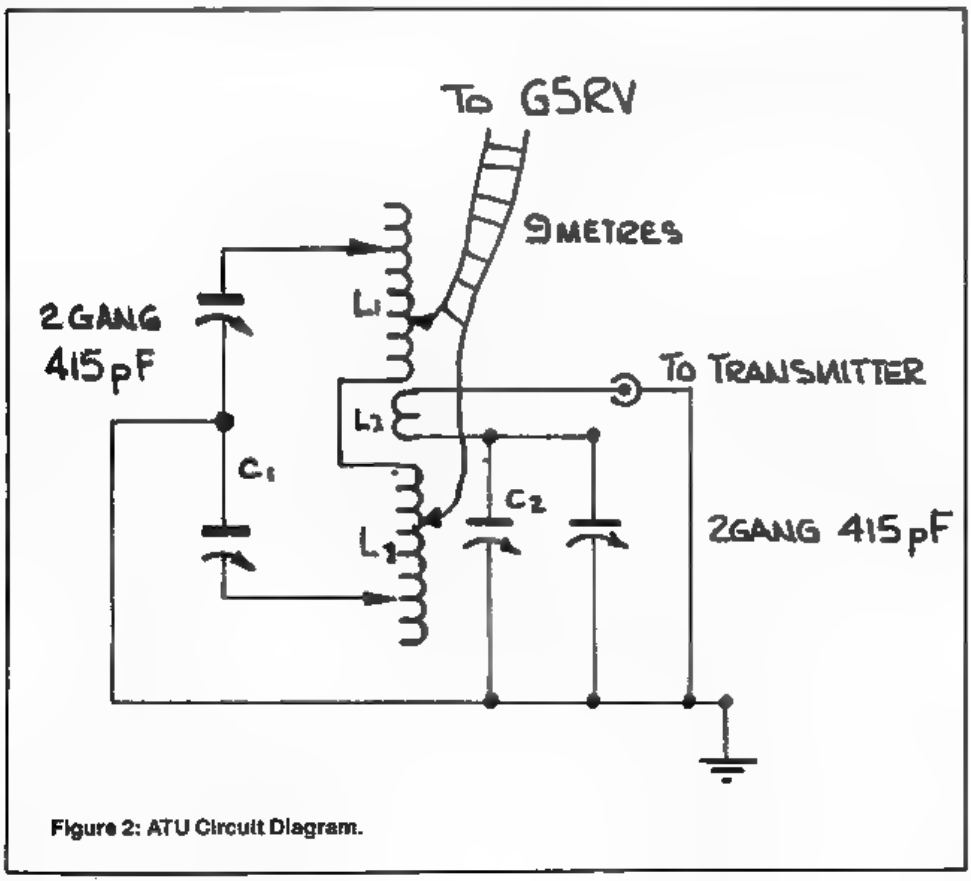


Figure 2: ATU Circuit Diagram.

Unfortunately, calling CQ on 3.580 MHz does not receive many replies as the frequency is out of the CW allocation Ask a nearby amateur to listen for you. A good time for operating is early morning or evening t me

The band is sparsely populated and contacts up to a few hundred kilometres can be achieved with five watts.

For those living in south-west Western Australia, VK6ED will accept call- backs in CW after the WIA news broadcast on 3.580 MHz. It is wise to call in late during the call-backs so as not to delay the SSB operators.

Since the local council put a ban on towers I've had more time to pursue my interest in trees. . .

—VK3BTU

TIPS FOR FASTER COPYING WITH CW

Dean Probert VK5LB
RMD Verral Road, Hope Forest, SA. 5172

As soon as the speed creeps up a little most of us begin to experience anxiety and tension whilst attempting to write it down without missing a letter!

Every person who masters the code finds, at some time, that there are tricks and techniques which help in accurately putting on paper what is sent. There are no revolutionary breakthroughs here, just a collection of ideas which help when the speed of transmitted codes rises.

Remember when you listened to other amateurs or the WIA practice sessions? It was fine while the code was below, or equal to your level of receiving ability. As soon as the speed crept up a bit most of us began to experience anxiety and tension while attempting to get it down without missing a letter. I am sure you know what I mean.

RELAXATION

The following fundamental point must be kept in mind. Code is easier to copy, and is copied more accurately when you are relaxed in body and mind. No one wants to miss any of it. Perfection is a creator of tension leading to frustration which can build up to a destructive level. It is important to keep your efforts creative. The learning experience never ends so don't teach yourself bad habits. Think about how you can improve your code and keep tension under control. Select a style of copying which suits you and stick to it. Achieve consistency in your code habits. This will lead to familiarity, relaxation and confidence. Use a pen, ballpoint, typewriter, or whatever suits **you**. Stick to it once you find what works for you.

DISTRACTION

I wear headphones, comfortable ones. Apart from sparing the rest of my non-amateur family the sound of the incoming traffic, I do not have the distraction of what is going on around me. Noise affects concentration and increases tension. I print. I find it easier and as fast as writing. Most of my friends find that writing code is better. (Most of the experts would agree with them. Ed).

Printing takes a little more energy so do what is best for you. Select a way of writing which is easy and natural. When increasing your code speed, write or print each letter separately. Put a space between letters and make each letter bigger than you would normally. This gives a feeling of freedom and relaxation. Have you found that, as code speed increases past your ability, you tend to write smaller and more cramped? It is a natural reaction but by writing "big" and spacing this tension can be controlled. Think small and your nerves tighten.

ATTENTION

Don't stare at the word you are copying. Especially if it is a long, unfamiliar or unexpected one. You naturally expect to be able to anticipate the rest once part of the word has been sent. Fine, but let your attention wander around the word as a whole. Let the sound of the code give you the whole word ad not the letters which make it up. If you find that the temptation is to glue your eyes to the word as it is unfolding, then cover the message if it is distracting you. The message may not take the form you have anticipated, or the portion you have copied may not make sense to you, which creates tension.

You may find the speed or the tension building to a point where you just know that you are going to miss the next letter or three coming up. Close your eyes and relax letting the sound of the code alone prompt you. The visual break stops anticipation. It acts as a tension release. With your eyes shut the only stimulus is the sound of the code.

When you miss a letter do not worry about it. Forget it straight away. In fact, if you feel you are going to miss a letter then do so. Ignore the next letter and copy the one following. If you do not ignore the one which is missed you probably will find two or three will also slip past creating a volcano of frustration. It is human nature. Especially when the code speed is pretty fast.

Accept the fact that some days it pays not to get out of bed. We have good days and the other sort. Some days are not the best for practicing faster code so why force it? You want a relaxed and confident attitude so make it as easy for yourself as possible.

HIGHER SPEED

Once code speed creeps up past about 22 words per minute the emphasis shifts from recognition of individual letters to letter groupings and word clusters such as the, of, -ing, and -ly. We must learn to recognise and copy such sounds as a reflex action.

Every code student has heard of 'copying behind' I am sure. Training yourself to copy a second or more behind the letter being sent is the idea. You consciously and deliberately delay writing down the letter sent until one or more subsequent letters are sent. It was this system that Ted McElroy used in a tournament in Ashville, North Carolina, July 2, 1939, when he officially copied code at 75.2 words per minute.

Most people at some stage write down each letter exactly as it is sent, and exactly when it is sent. This leads to slavish desperation to copy in step with the letter being sent. One therefore cannot relax one's guard for a moment for fear of missing one. I used to do it. It is a viciously uncomfortable way to copy code and limits copying speed severely. The spoken word is not made up of individually pronounced letters but of groups of sounds which make up the word. I think you have the idea.

Copying behind is the relaxing way to copy, tension free in comparison to the other way. It is also easier said than done. It takes a lot of discipline and practice to 'hold back' on writing each letter down as it is sent, the instant your hear it. Try to copy at a speed just slightly higher than your solid copy speed. Once that speed becomes comfortable, move on before your learning ability also feels too comfortable. Do not move on until you can comfortably copy behind at that speed though. Try copying in your head, without writing down what is sent. This frees you further from old copying 'slavish' habits and tensions and increases confidence. Copying behind and copying without writing are great confidence builders.

COMPUTER

I used a computer for code practice for a long time. I was able to avoid copying bad code from 'on air' amateurs and could set the speed, text or code groups to suit myself.

Some operators enjoy the rhythm so much they improvise on the score producing the so-called Lake Erie Swingers. Copy only the best code you can on air and on computer.

Also, be realistic about how fast is practical to use on air. I can send much faster than I can receive.

My computer sends code and I use it to reduce fatigue where similar messages have to be sent over and over. I have found that attempting to receive code at speeds significantly slower than my normal speed is tiring and frustrating. For this reason it would be unwise to learn to use code at say 50 words per minute if most work is done around 12 to 18 words per minute. Only a kid would get up to 50 words per minute solely for boasting purposes or to 'big-note' himself on air. If you want to razzle-dazzle them, do it with top code and operating practices, consideration and good manners. Most of the foregoing is common sense anyway and so I wish you all tension-free-code, whatever speed you find suits you.

RATIONALISING R M S

Don Law VK2AIL
RMB 626 Adelong Road, Tumblong, NSW 2729

If you display a sinusoidal voltage on an oscilloscope, what you see is what you've got!

Let us suppose that the amplitude is 700 volts, **peak to peak.** Centred on the zero axis of the graticule it is apparent that the voltage excursion is between +350 volts and -350 volts. The **peak** value is 350 volts. The significance is that an electric fire-bar, for instance, being totally oblivious of the actual current direction heats up to the tune of 350 volts peak.

The anomaly is that if you applied 350 volts DC to the fire-bar it would get very much hotter and probably melt. What DC value then, would give the same heating effect, the same power or energy, as 350 volts peak?

Obviously this DC voltage will be lower because the AC voltage is not constant at its peak value and has some sort of average or mean between zero and 350 volts. (Note that the average value of a sine wave is zero but our fire-bar does not know this).

To find the mean value of a sine wave it is only necessary to sample the first quarter cycle. Remarkably few samples are needed.

Sine values range from zero at 0 degrees to one at 90 degrees, so it is convenient to use an amplitude of one volt **peak** in our sampling. The proportions will hold true for any voltage: our result will serve as a multiplier.

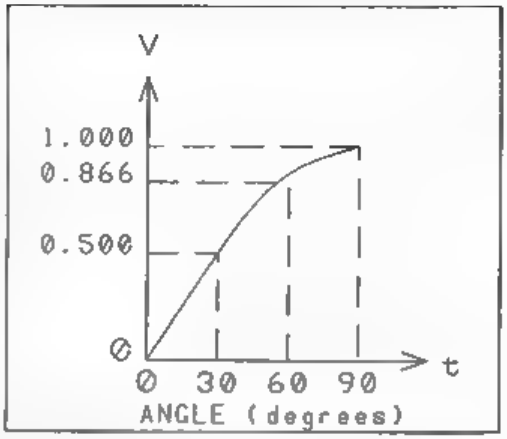


Figure 1. Note that two samples, maximum and minimum, would give the same result but would be erroneous by not taking into account the shape of the wave, ie it could be a short duration pulse.

Because $P = V^2/R$ the samples must first be squared.

SAMPLE	ANGLE (θ)	VOLTAGE (Sine θ)	VOLTAGE²
1	0°	0	0
2	30°	0.5	0.25
3	60°	0.866	0.75
4	90°	1.000	1.00
			2.0

Divide by 4 (samples)
ANS 0.5

Needing to equate the heating effect or power we first squared the voltage samples but now, being interested in the equivalent DC voltage (for the same power) we will have to extract the square root of our answer which is 0.707. Multiplying 350 volts by 0.707 gives 254.520 volts RMS which is a little high for the mains but makes the point.

To summarise:

What you see on the oscilloscope is **peak to peak.**

Peak values are half **peak to peak.**

RMS values are 0.707 x **peak,** (for sine wave only).

What is this RMS? Well, it stands for Root Mean Squared or more clearly, so you will get the operational order right:

$$\sqrt{\frac{V^2_1 + V^2_2 + V^2_3 \ldots + V^2_n}{n}}$$

mr

MORE ON TILTING THE YAGI

Harold French VK3ZRM
RMB 1190, Yinnar, Vic. 3869

A method of single wire and earth return control which still permits the use of limit switches to obviate over-run.

I was interested to read the article by George VK3GI, describing the method of solving the beam tilting problem.

Following is a method of single wire and earth return control which still permits the use of limit switches to obviate over-run.

OPERATION

Figure 1 shows the circuit conditions which prevail when the antenna is in the vertical position.

PS will be closed in the vertical position connecting +ve from the power supply, and LED 1 will be lit to indicate that the beam is vertically polarised.

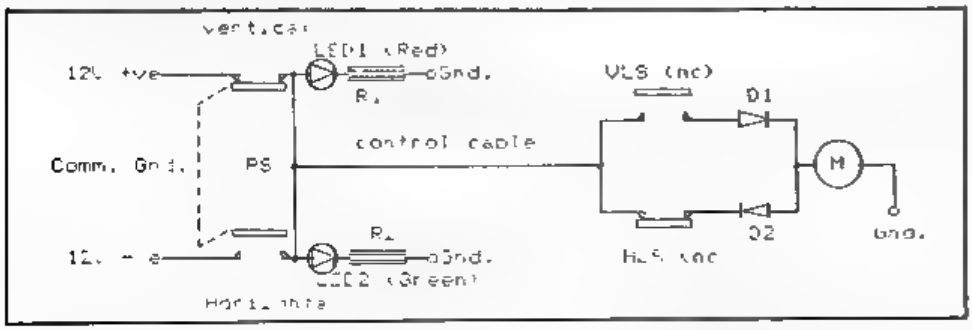


Figure 1

PS	**SPDT Switch rated to suit the motor**
LED 1	**Red LED.**
LED 2	**Green LED.**
R1, R2	**830 ohm, ½ watt.**
D1 D2	**Diodes to carry Motor Current.**
VLS	**Vertical Limit Switch. (Normally closed contacts).**
HLS	**Horizontal Limit Switch. (Normally closed contacts).**
M	**Permanent Magnet type Motor.**

VLS, the Vertical Limit Switch, is operated by a cam on the boom and will be open circuit while the beam is vertical and thus no current can flow in the motor.

D2 is reverse biased and no current can flow in the motor via HLS which is in its normally closed position.

When it is required to change to horizontal polarisation, PS will be changed over and -ve, from the power supply, will be connected to the control wire. Current will flow through D2 which is now forward biased and the closed contacts of HLS, to the motor, which will rotate in the opposite direction to bring the beam to the horizontal position.

As the boom commences to move, VLS will be operated and reclose the circuit via D1, which is now reverse biased. This serves no useful purpose at this time other than to prepare the circuit for the next time the antenna will be required to be changed to the vertical position.

When the beam reaches the horizontal position, HLS will be operated by the boom-mounted cam opening the circuit and the motor will stop.

LED 2 will be lit to indicate that the antenna is in the horizontal position.

Note that both of the Limit Switches are closed when the boom is in an intermediate position and the appropriate path for the motor current is switched by the diodes D1 or D2.

mr

THREE DXCC COUNTRIES

Ken McLachlan VK3AH
PO Box 39, Mooroolbark, Vic. 3138

SVALBARD — JW

Many VK amateurs have had the pleasure of working a JW station, generally someone who is stationed at the meteorological office or the airfield doing a tour of duty from their homeland. The same applies for the rarer JX prefix, but that is another story.

Svalbard, meaning "cold coast", covering an area of 62,000 square kilometres (mostly covered by glaciers frozen as deep as 300 metres) is comprised of several groups of small islands, belonging to the Kingdom of Norway. First discovered in 1194, Svalbard remained unknown and charted until it was rediscovered by two Dutch explorers in 1596. Soon after, Dutch and English whalers arrived, quickly followed by the French, Danish and Norwegian fleets seeking the valuable mammals.

Quarrels and the arrival of the Russians led to a division of the coast. By 1800, the interest in whaling declined and the area was not visited frequently until the beginning of the 20th century, when it was found that there was an abundance of coal that could be mined and claims were made by companies based in the United States, Britain, the Netherlands, Norway, Sweden and Russia.

It was not until 1920 that Norway gained sovereignty over the archipelago and mineral rights were given to the United States, France, Italy, Japan, the Netherlands, Norway, Denmark and Sweden. Five years later Russia, was given a proportionate share and all became signatories to a treaty.

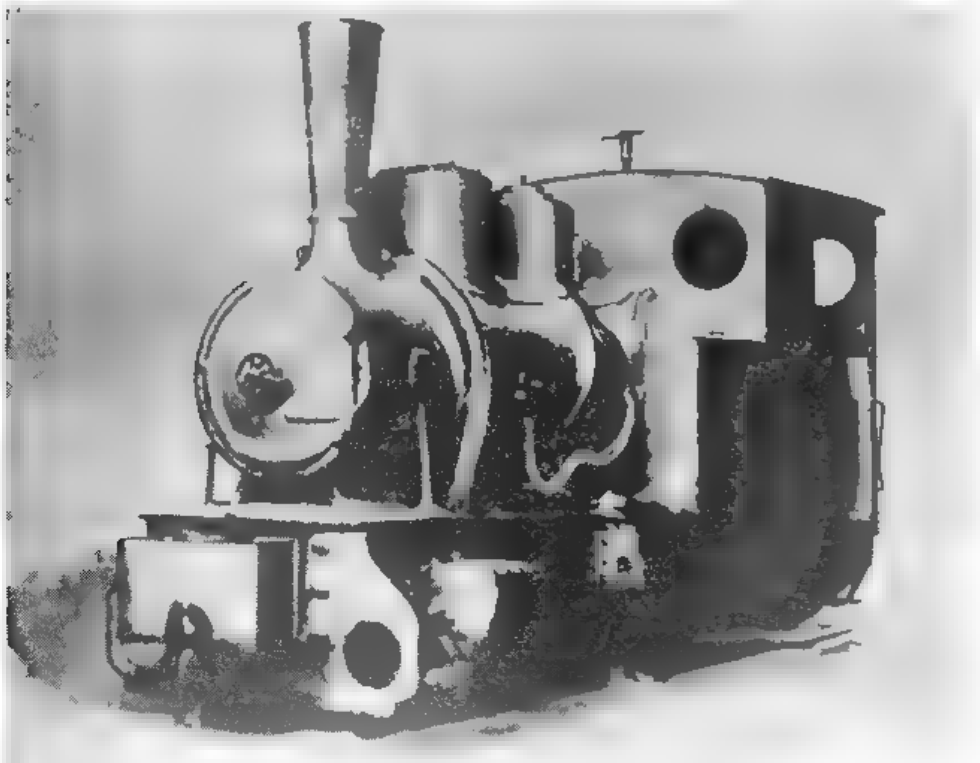
The first commercial coal mine was struck by an American, John Longyear, in a town to be named after him — Longyearbyen — known as *The City of the Longyear* because of its four months of darkness each year. The mine was bought out by a Norwegian consortium in 1916, and is now called the Great Norwegian Coal Company of Spitsbergen.

Life is not that pleasant in Longyearbyen, left with two mining operations, one being run by Norway, the other by Russia, the Russian employees outnumbering the Norwegians by two to one, with the weather and the long period of complete darkness coupled with the dust, pollutants and smog from the mines which are slower to disseminate into the atmosphere because of the weather. The main reason the Norwegian workers stay, is the money made by taxation compensations, as the pay in their home country is fairly similar and there are few places to spend it in Svalbard. One can save a considerable sum over a couple of years.

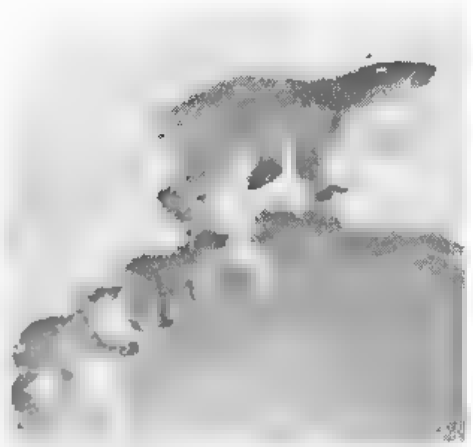
The area is well catered for, with regular mail and other necessities being flown in to a modern airport that is shared and serviced by the two countries. Continuous land exploration for other minerals is carried on but not even oil has been found. Maybe the geologists will have to go offshore as they did in the North Sea to gain their riches. If found, to the east where the Barents Sea flows, there would be a rush by the treaty countries to exploit the area but that becomes a contentious subject, for is it practicable with the moving pack-ice and would it curtail the access of military ships and submarines to the large installations at Murmansk, Franz Josef Land and the nuclear test site at Novaya Zemlya?

Most animal and bird life is protected by Norwegian law which governs all occupants of the area, who enjoy winter temperatures as low as -40 degrees Celsius and rising to a high of +5 degrees in the summer.

Value that QSO with that station in the far north, as you have shared a dreary few minutes with someone that is used to a lonesome lifestyle, which many of us in VK could not accept.



One of the old train engines (circa 1916), that used to haul the coal out of the mines.



A not so friendly Polar Bear, with a couple of cubs.

TAIWAN

Until recently, to have a contact with an amateur station in Taiwan was quite an achievement, as there was only one amateur allowed to operate — Tim Chen, who either signed as BV2A or BV2B, depending what mode he was using. Tim tried to accommodate allcomers at all times when he wasn't working at his other love, the film industry.

Tim, one of natures gentleman and an astute business man (as I have had personal dealings with him) was the advocate of more amateurs in Taiwan. Tim was ably assisted by the DX Family Foundation members from Japan, who made quite an impact on the administration that they allowed privileges to be extended to members of the Radio Club, who passed the necessary examinations.

Taiwan, situated in an area bounded to the north by the East China Sea, to the east by the Pacific Ocean, to the south by a channel separating it from the Philippines and to the west by Formosa Strait, in itself a main island, also comprises 15 islands in the Taiwan group and 64 small islands in the Pescadores Archipelago. All up, the area exceeds 36 000 square kilometres and supports quite an unknown number of inhabitants due to the population more than doubling in the period between 1949 and 1960, though it is also known that the birth and mortality rate dropped by 50 percent in this period. It is estimated that more than nearly two million people migrated to Taiwan, during the period 1947 to 1971.

Taiwan has a varied plant and animal life which include cedars, cyprus, junipers and an abundance of rhododendrons and maples with the animal life being similar to the southern Chinese mainland which include deer, wild boars, bears of many different species, monkeys, goats, wildcats and panthers. The birdlife is also abundant and include pheasants, kingfishers, larks and many other species which enjoy a long summer, which generally lasts from April until November with the annual rainfall being in the vicinity of 2 500 millimetres, though this figure has been known to double in the summer months alone. The average temperature in this period rarely exceeds 30 degrees Celsius, yet in winter the mountains are generally covered in snow.

The main language spoken is Mandarin, but there are many variations and different dialects including at least 13 aboriginal versions, some with names that are not pronounceable and many of these are coupled to various religions. The Chinese brought Buddhism and Taoism following

the Dutch in 1622 who introduced the Protestant Christianity, followed two years later by the Spanish, who introduced Roman Catholicism to the island. Shortly after this period, the Japanese introduced Shintoism. In all, Confucianism and Taoism, known to exist for more than 2 000 years, would have been the main influence on the ethics, morality and academic thinking of these friendly people.

The island really should be called the "Island of Worship", as there are some 3 000 Taoist, 2 000 Buddhist, 3 000 Protestant and in excess of 1 000 Roman Catholic places of worship.

Taiwan, has many resources with more than 50 different minerals that can be mined, including an extensive area of coal, gold and copper to mention a few. Timber is abundant in the high mountain area and it is estimated that one quarter of the vast area that supports so many people, is arable and fully cultivated. Rice, would be the most important crop, taking up half of the cultivated area. Sugar cane, tea, hemp, jute, and wheat are harvested whilst pineapples, bananas, litchis, peaches, watermelons and oranges are all canned for export.

Every amateur knows that Taiwan, is recognised for its manufacture of electrical and electronic equipment and they are priced to compete against a world market, with which they are being quite successful. Their trade balance until the the mid-1980s was very shaky, but with the export of textile, electronic and other goods they are now in a comfortable position.

It is interesting to note that Taiwan, with its capital being Taipei, which is the seat of government, has an excellent road system which extends to some 16 000 kilometres, backed up by a 3 000 kilometre rail system of two gauges, oddly one being roughly one metre and the other three quarters of a metre.

The islands are serviced by five seaports, all able to take vessels of a deep draught. The port closest to and serving the capital is Chi-lung. There are two main airports and several domestic ones that service the island area and are used extensively by the population daily.

The administration is controlled by the central government of the Republic of China, which recognises that the island is the 22nd province of China, however the Nationalist government of Taiwan has continued to claim jurisdiction over the Chinese mainland and the Peoples Republic of China on the mainland has claimed jurisdiction over Taiwan which is correctly spelled T'ai-wan and formerly known as Formosa, a name given by the Portuguese explorers, which when translated means "beautiful".

The media is well represented on the island by no less than 30 daily newspapers being printed, two of these being exclusively printed in English and some 1500 periodicals generally pertinent to certain organisations. The radio frequency spectrum has made room for about 30 radio companies who have 160 outlets throughout the area. Colour television has three outlets with repeater stations. One of these consortiums The Chinese Television Service devotes a lot of on-air production to education.

So when you contact a station from Taiwan, you will have a little knowledge of their background and what the island is like. The history of the island that goes back for centuries is enchanting, and for those that are interested, it is worthwhile reading. Sources of material are plentiful and a call to your local library should provide you with many hours of interesting reading. In the meantime enjoy your QSOs with the ever increasing number of BV prefix stations that are populating the amateur bands.

SYRIA — YK

The *1986 International Call Book* boasts 10 amateurs in a country born in 1946 as the Syrian Arab Republic, amid the ruins of ancient empires that go back some 4000 years. The republic has an area of 185 180 square kilometres and is bounded by a short coastline of 180 kilometres to the Mediterranean Sea, where one can behold some of the best beaches in the world, that lay between the nations of Turkey (TA) and Lebanon (OD). At the present time, due to the fractions that are occurring in that area, it is virtually impossible to accurately estimate the population, but it is believed that it is in the order of nine million and the capital Damascus, which had a population estimated to be in the order of 250 000 in 1940 has grown to an incredible one and a half million.

The itinerant movements of "visitors" and "refugees" has drained the economy and strained a very tight budget to the limits mainly because of its necessary defence requirements and the introduction of compulsory education, which accounts for more than 20 percent of the population. Some 50 000 students attend the university in Damascus and it is estimated than one fifth of these are females. The males who attend, are exempt from the 30 months of compulsory military service until their education is complete. At present, all females are exempt from compulsory training.

The land formation of this country is complicated as it varies from mountains, coastal plains to a large desolate desert that absorbs most of its area. The Jabal Alawite mountains that average 30 kilometres in width run from north to south and range in height and range from 900 metres to 600 metres in the south. The Jabal ash-Sharqi mountains mark the border of Lebanon and Syria, the highest peak being 2 600 metres. Many small mountains are scattered around the country and the highest peak is Mount Hermon, which rises to 2 814 metres.

The rest of the country is undulating plains known as the Syrian Desert that lays between 300 and 500 metres above sea level and the surface is not a sand base as one would think but a mixture of rock and gravel which is quite porous, forming underground springs, rivers and watercourses, which with low precipitation, can become quite saline.

The climate from May to October, is a long dry season with temperatures on the coast varying from 30 degrees Celsius to 10 degrees Celsius in winter. Inland is a different story — in the arid regions the mercury can rise to 50 degrees Celsius and in the winter snow and frosts are quite common.

Forests around the mountain regions contain such trees as myrtle, boxwood, turpentine and wild olive varieties and due to excessive exploitation, the government has placed stringent regulations upon their removal and is progressing with cultivation. Wild animal life is very sparse, though hyenas, badgers, boer, deer and bears can be seen at times. In the desert area, vipers and lizards are quite plentiful.

The most used language is Arabic, as Islam is the predominant religion. Other languages that are used in the minority, are Kurdish, Armenian and Turkish. There are 12 other recognised religions in the country.

Syria depends on many natural resources including oil, natural gas and phosphates. Hydro electric power is obtained mainly from the Euphrates and a few of the smaller rivers which are not very dependable and in these cases oil is used as a substitute, for supplying the power to the quarrying and allied industries.

Other sources of income are derived from the manufacture of wool, cotton, nylon and natural silk. Items such as pharmaceuticals, batteries and plywood are exported and occasionally some of the old traditional copper and brass work can be found.

Education is compulsory for all children from the age of eight, schoolbooks and all education is free for their six years of primary, three years of lower secondary and three years of senior secondary level. They are then eligible for tertiary education, which if they pursue, their compulsory military training is deferred.

Unfortunately the country's rate of population is not in proportion to its economic rate and it must be understood that only one half of Syria's area can support any industry and habitation.

Of all reports it appears our hobby is not encouraged and it is really unusual, seeing the number of the younger generation that are present in the schools, but equipment imports are heavily taxed and yearly salaries are very low. By all accounts unemployment is extremely high even for the qualified graduates from the universities.

I hope the above has given you a better understanding of one of the rarer DX countries.

HOT SPOT CONFERENCE '88
NEW ZEALAND'S SUNSHINE COAST

An official invitation is extended to all amateur radio operators and their families, by members of the NZART Branch 51 (Eastern Bay of Plenty), Tauranga and Kawerau, to attend the Hot Spot Convention which will be held over the Queens Birthday Weekend, June 3, 4 and 5, at Whakatane.

The group offer hospitality, feature guest speakers, a program to suit all, excellent venues, accommodation of your choice and no earthquakes or other disasters.

Hear and meet William I Orr W6SAI, author and co-author of many radio publications.

Enjoy two hours of 'Amateur Trading" — bring/sell your surplus equipment or re-stock your shack.

Excellent food — all meals except two breakfasts are provided in the weekend events.

Be at the Official Opening on Friday evening and hear the Key Note Address by Bill Orr W6SAI.

Wine, dine and dance to a six piece Convention Dance Band in the Memorial Stadium.

Social evening and light entertainment on Sunday evening.

Registration forms are available from the Conference Secretary, PO Box 2165, Whakatane.

For further information, join the Branch 51 Net on 3.722 MHz every Monday night at 1930 UTC (ZL1AIU is Net Control Station).

CONCERN RAISED ABOUT RF ENERGY AND CANCER

An alleged link between amateur radio operators and certain forms of cancer has once again found its way into the press. A similar incident occurred in 1985. Reportedly, in an article by Doctor Milham appeared in the *Lancet* the British Journal of Medicine, (April 6, 1985), where he studied the deaths of 1691 Silent Keys from Washington state and California. He claimed he found a greater number of deaths among the Silent Keys from certain kinds of leukemias than were reported in the general population of white males in a typical year.

Concern over this is understandable, but before you pull the plug on that amateur rig there are a few things to consider. This study also showed that radio amateurs had fewer deaths than the general population from certain other kinds of leukemia, and in the earlier article there were, in the opinion of competent professionals, serious flaws in Doctor Milham's methodology. For example, *QST* Silent Key lists include only about one-third of deceased radio amateurs (not all are reported) and those who are reported are not representative of the population as a whole. The bottom line is that, even the experts have disagreed as to the significance of the study, and it certainly did not establish a causal link between amateur radio operation and certain cancer incidence.

Further comment can only be made after a detailed review of the new study!

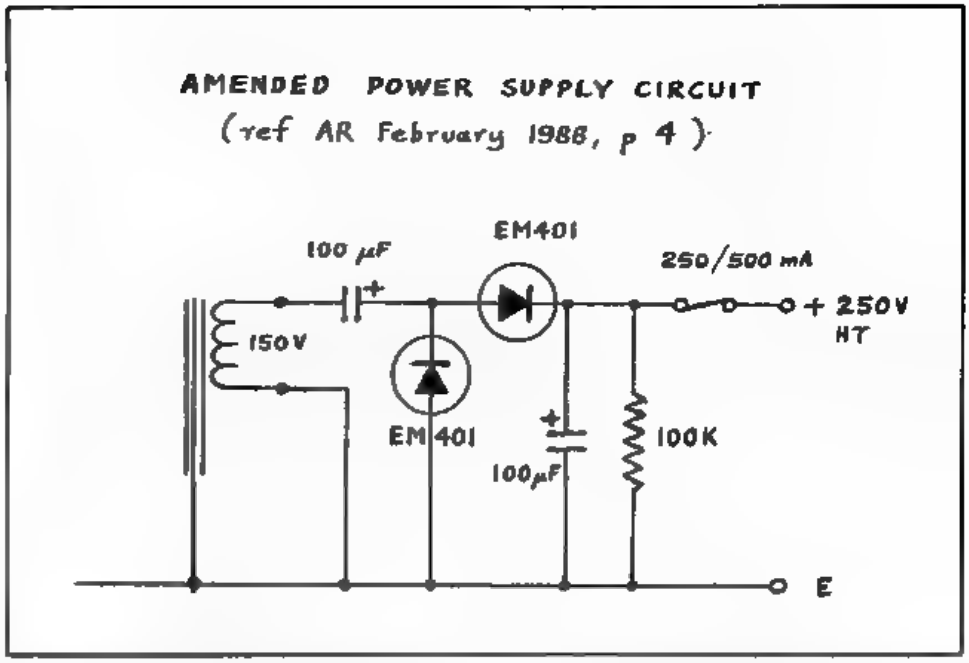
—Contributed by Allan Foscroft VK3AE from the *ARRL Letter*, January 15, 1988

MURPHY'S DEPARTMENT

Some months go by without needing any apology for errors in preceding issues. This isn't one of them! Rather than a small corner, we have had to expand our Murphy segment into a full department this month.

The item whose errors caused the most disturbance was on page 4 of the February issue. Two eagle-eyed readers went to the trouble of writing to point out to us the various mistakes, beginning with the title. As both VK7ZRR and VK4SO could see at a glance, it is not a 16 amp supply. Perhaps a decimal point disappeared? 0.16 amps sounds more reasonable, and 160 mA is much more consistent with the fuse and diode ratings. The transformer current rating and winding resistance will also affect the end result, so no accurate figures can be given in their absence.

More disturbing is that the published circuit is wrong. Both Derek and Mervyn pointed out, and hopefully about 99 percent of all other readers realised, that it was meant to be a voltage doubler and was consequently lacking one of the necessary two capacitors. It did have the necessary two diodes, but one was connected where it could have no effect. The correct circuit is shown in Figure 1. The original primary and filament winding connections remain as they were, although the parts list specifies a DPDT switch when a DPST as shown is sufficient.



VOLTAGE DOUBLER

For the benefit of newcomers it may be useful to explain the voltage doubler principle as a scheme whereby one capacitor is charged via one diode on one supply half-cycle, the other capacitor via the other diode on the next half-cycle; and the two capacitors, in series, are discharged into the load. The output voltage can thus approach twice the peak input at no load, but falls considerably with increasing load current, or in other words has poor regulation (compared with a similarly rated supply using a higher voltage transformer and full wave rectification).

One other alteration has been made to the circuit. The 100k bleed resistor has been placed before the fuse, in VK7ZRR's words, "enabling the resistor to perform its bleed function even in the event of a blown fuse". Also, we are inclined to agree with VK4SO when he asks, "is a bleeder shunt pulling only 2.5 mA really sufficient?" On no load the output voltage could still be dangerously high for half a minute or more after switch-off (100 microfarads and 100k is a time constant of 10 seconds). Even the 100k needs to be a one watt rating. A 10k bleeder would dissipate 6.25 watts. Something like 20 or 22k rated at five watts sounds better, with a time constant of only two seconds.

It may also be argued that the first capacitor ought to be 200 microfarads, in this particular circuit. Its voltage rating need be only half that of the output capacitor, but the circuit will still work with equal capacitors, although with slightly poorer regulation.

DEATHTRAP?

Mervyn VK4SO, also refers to a "deathtrap", by the same author as the power supply, on page 28 of the February issue. This was the shorting-stick made from the plunger shaft of a discarded fly-spray dispenser. Really, Mervyn? The only risk would be from forgetting to ground the clip wire first, or from the wire not being properly fastened to the shaft and falling off at the psychological moment. Both factors are well under the user's control. Perhaps it could be improved by a plastic disc at the front of the handle to keep finger-tips out of harm's way. If, as suggested by the drawing, there is a metal ferrule over the front of the handle, this should obviously be removed. After all, such a device is only going to be used by someone with some understanding of what they are doing. Maybe it is not foolproof, but hardly a deathtrap!

MARCH ISSUE

Roy V3AOH, points out to us that in the circuit of his protected power supply on page 23 of the March issue, the captions on diodes D1 and D2 have been reversed. This has no effect on the circuit, but causes the operation as described in the text to be a little confusing.

APOLOGIES

We apologise for the various errors detailed above, and hope that no-one has been inconvenienced too much by them. Some began with the author, should have been spotted by editors and were not, or maybe the draftspeople were confused by an over-rough sketch, or whatever! I have a feeling that most of the problems coincided with editorial holidays! Sorry folks, we must try harder. But it is nice to know we have so many keen-eyed readers!

AX3ABP

Guidelines for AR Magazine Articles

Writing an article for *Amateur Radio* magazine is not difficult — even if you have never attempted such a task before. Here are some guidelines to help you get something published.

Pick your subject — it could be something of a technical nature or a general interest item.

The first step is to put down on paper some major headings — in other words, an outline or skeleton for your article.

The difficult part is getting started — once this is overcome words and thoughts often begin to flow freely.

Very few people get a written article word perfect and in logical order at the first attempt.

The idea is to make a start by putting something down on paper first, then review, edit and improve.

Use short simple words avoiding the repetition of words and phrases. Try to use short sentences of an average length around 14 words but not more than say 30 words — remember short sentences make for easy-to-read writing.

Articles should preferably be typewritten (although neat handscript will be accepted) on one side of plain paper and double spaced. Leave a margin down the left hand side.

An old adage is that a picture is worth a thousand words and this is very true.

When writing an article, plan if possible to include a photograph or two and maybe an illustration or schematic diagram. These help break up the text and make an article more interesting.

Photographs intended for printing must be sharp, clear and with plenty of contrast. Small detail in pictures is lost when reproduced in newsprint.

Prints should be glossy and about 25 centimetres by 20 centimetres, although smaller prints can be used.

Black and white prints produce the best result, but if you only have colour prints, these should be included with your article.

Diagrams and other illustrations can be submitted with articles, they need not be top quality drawings. AR magazine has drafting experts available to re-draw your diagrams to meet the required standard.

All technical articles experience a delay because they are checked by the magazine's technical editors before being published.

General interest or non-technical articles are published when space is available. Those of a timely or news nature get preferential treatment.

Contributors should send their material to: The Editor, AR magazine, Wireless Institute of Australia, PO Box 300, Caulfield South, Vic. 3162.

—Contributed by Jim Linton VK3PC

FUTURE OF AMATEUR RADIO
— A Novice Viewpoint

Peter Parker VK6NNN
C/- Post Office, Witchcliffe, WA 6286

Many proposals of the future of our hobby have suggested altering the novice licence but have been proposed by full or limited licensees.

Here is a novice viewpoint. (The opinions expressed are not necessarily those of the WIA, but are obviously the result of a good deal of thought. Ed)

Many of the proposals put forward have failed to address our problems in the amateur service. "Change for change's sake" seems to motivate some people while others disguise giving more privileges as "updating" or "enhancing".

Some of our problems are as follows:
— lack of youth involvement
— less experimentation
— slow growth in our population
— cost
— public awareness

To approach these one by one:

LACK OF YOUTH INVOLVEMENT

Not a large proportion of amateurs are under 20 — the Linton/Harrison paper suggests only one percent of WIA members. What with $30 examination fee, $6 for the NAOCP Certificate and then $28 a year for a licence, I am sure many young amateurs cannot afford WIA membership. As the survey only included WIA members, it may not be representative of the whole amateur fraternity.

Some adults who have asked about amateur radio have told me "I learned Morse code in the Scouts/Guides but I have forgotten it now" or "I built a crystal set 30 years ago". How many youth today have built a crystal set? The truth is, not many even though one is easier to build now than ever before. Further, in this age of transistors, it is easy to amplify the output with less than one dollars' worth of components. We have more of a public awareness problem on our hands than a need to alter radically our licensing system. One genuine problem is cost. I propose a way of solving this.

From reading the letter by VK5PI in AR, May 1986, as well as some electronics magazines of the 1960s, it seems that the YRCS system was a good idea and its demise is a pity. Some people promote the idea of "student licenses". There is absolutely no need for licences below the novice level. Anyone who has a genuine desire for entry to our wonderful hobby should be able, with dedication, to attempt and pass the NAOCP. I speak from experience, and indeed getting on air was harder than the NAOCP license study.

LESS EXPERIMENTATION

The second point is the most important. It is one of the reasons amateur radio exists. All other radio communication services do not allow it, but amateur operators have freedoms and bands not enjoyed by any other service. Most other communications services are concerned simply with getting messages from A to B, provided they can do that reliably and well, they are satisfied. Amateurs on the other hand are concerned as well with the technical intricacies of the whole science of radio. We should never be satisfied, we should be embracing new techniques and our Institute should be promoting modes such as SSTV, ATV, FAX, etc. Once we were ahead of the professionals — now, in many aspects, we are lagging behind. Until we can get ahead again our frequencies are threatened. The next major WARC, ITU conference possibly in 1992, will be the most challenging ever. Our service will need to do all it can to justify our allocations. My proposals, later in this article, will go a long way towards promoting experimentation by amateurs.

As well as accepting my proposals, the WIA needs to promote new modes — here are just two suggestions:

— a rare modes contest for SSTV, FAX, etc.

— A national register of all members who use these exotic modes. This is so members can ask nearby listed amateurs for help in getting started in an unusual mode — this is what our hobby is all about.

The importance of experimentation to the survival of our frequency allocations is illustrated in this statement made at WARC-71 on space telecommunications. (From *Electronics Australia* December 1971, page 117).

> "You fellows aren't amateurs any more. An amateur is supposed to be primarily an experimenter, to build his own equipment, to try out new circuits, to develop ideas. You did this years ago but no longer. All you do is lay out a few hundred dollars (thousand dollars in 1988) and buy station equipment entirely commercially made. When something goes wrong, you even send it back to the manufacturer for repair. You are not amateurs; you are just communicators. We can't afford frequencies for such activities."

This view came from several of the most enlightened and progressive administrations. It is not entirely correct as some of amateurs' technical triumphs involve operating, such as aircraft enhancement. It does contain a lot of truth. Once the proposed novice licence, with its bias to experimentation, is implemented, Australian amateurs would not deserve this criticism.

SLOW GROWTH IN OUR POPULATION

Our third problem is the lack of growth in our population. Benefits of increasing population are:

— Many of our bands are empty much of the day, eg 160, 80, 40, 6 metres. More operators would increase activity on these neglected bands. The potential of these bands has yet to be explored. For example, on 80 metres one day at 2 pm local time, the writer had a QRP CW contact using a G5RV to Perth — about 250 kilometre distant. Such contacts are rare because of a lack of active operators. More operators would increase band activity.

— More WIA members. This is only a possibility and we have to ensure that the WIA membership growth rate is at least equal to the growth rate of the amateur service as a whole. This would improve AR magazine by increasing WIA income.

— With more amateur operators, public awareness, so important when dealing with towers or TVI cases, increase slightly.

I believe growth of the amateur service should not be pursued regardless of expense, rather as a positive side-effect this licence will bring.

COST

The fourth problem is the cost of entering the hobby which must be held down. If the cost of entering the amateur service increases, the attractiveness of the hobby will decrease. Low cost and home-building are synonymous. Home building also promotes technical investigation, which is a major justification for our hobby.

PUBLIC AWARENESS

Public awareness of our hobby leaves much to be desired. If it were improved, TVI, tower and associated problems could be solved. Many of the population know of "amateur radio" but do not know what we do. A change of licensing system will not cure this problem. We really need amateur operators inviting TVI or tower complainants to see how their equipment works or amateurs giving lectures/demonstrations to people in schools, retirement homes or service clubs. Even if 99 percent or more of those people do not become amateurs, they would at least have a positive opinion of our hobby. Read the letter from Tony Lewis VK2EHL, in AR October 1987, as well as from VK5QT in December.

SUGGESTED APPROACH

The main thrust of this proposal is home-building. Appropriate privileges must be provided to give scope to the licence, but not so attractive as to discourage upgrading. We must keep novice licensees' privileges consistent with their understanding and equipment building capability. This excludes exotic modes and bands needing a high level of radio theory and constructional expertise.

Today we have novice licensees using equipment (eg modern transceivers) which most of them do not understand.

OPERATING PRIVILEGES

FREQUENCIES: 1.800-1.875, 3.500-3.700, 28.000-29.700, 52.000-54.000 MHz — crystal controlled only.
MODES: CW, AM, FM, DSB
POWER LIMIT: 10 watts DC input to the RF power amplifier
EQUIPMENT: To be compulsory that the licensee assemble any equipment connected with transmitting, eg transmitters, ATUs, transmitting aerials, power supplies, etc. Kits are permitted.
NOTE: A special arrangement could be made for physically disabled amateurs in that their equipment may be assembled by another amateur.

Some will see these privileges as restrictive, but they are entirely adequate for a novice licence. As an incentive to attempt the AOCP theory examination, combined licensees would be allowed SSB, VFOs and the use of commercially-made equipment on the novice bands.

Home-building requires communication in order to rectify problems, TVI and other technicalities. With the present system, we have the ridiculous situation where novice licensees cannot communicate directly with "Z-calls". A common band is required. I reject the proposal for two metres as it is already populated and its

allocation to novices will make upgrading less attractive. The novice licence was created to encourage more AOCP holders into our ranks. A similar band is 70 centimetres, however the construction techniques this band requires puts it out of the scope of novice licensees. It would be a worse choice than two metres.

Thus the preferred band is six metres or more precisely, 52-54 MHz. This band is under-used considering its very useful properties. Transmitters for this band would be more basic in construction as fewer multiplication stages are required to reach the band from a lower frequency crystal. On the receiving side, a converter for 52 MHz to say 3.5 MHz, has fewer image problems, critical layout and other constructional factors compared with higher frequency bands. Also, six metres provides the greatest VHF communication range under normal conditions, it is less affected by line-of-sight problems in mountainous areas.

We may expect that, by introducing home construction of equipment to new amateurs, it is quite likely that they will be the future technical pioneers.

In the early days, when most amateurs homebuilt equipment, it was they who were technologically ahead — now in many aspects of radio the professional users are ahead of amateur operators. Lack of money is one excuse put forward by amateurs, but many are not even trying. We must populate our SHF bands or lose them. If we do not experiment, our bands and privileges will be lost since one main justification of our bands (which are worth millions of dollars) is that amateurs can contribute to radio science. Only a small proportion of amateurs are contributing. This licensing system will increase that number.

A comment on power input limits. The present limit of 10 watts seems sensible as it is a useful amount of power. Higher power amplifiers tend to increased complexity. For a one valve CW transmitter the limit is sensible. (The rating of a 6GV8 (pentode) is 7 watts DC plate input which is safely within the limit).

MODES

Now to discuss the permitted modes. Those indicated are appropriate for beginners to attempt to construct transmitters. FM has been included so novices can use the repeaters on 10 and six metres and be more compatible with other licensees. FM also has a number of advantages over AM. SSB has not been included. An SSB transmitter would be a challenging project for AOCP licensees, and is too complicated for novices. DSB uses a wider bandwidth than SSB but this would not matter on 160, 10, six and the expanded 80 metres novice segment. With random interference, DSB is claimed to have a 6 dB advantage over SSB provided that complex bi-aural detection is used. Even with an ordinary product detector, SSB is only 3 dB better than DSB which is not very much considering the extra complexity of SSB. (From *Amateur Radio Techniques* by Pat Hawker G3VA. RSGB, Seventh Edition, page 117 — a very good book which is available from your Division).

EXAMINATIONS

With this altered licensing system, changes are needed to exam nations.

We will not need theory on VFOs, SSB, superheterodyne receivers and other related items. We will need to shift the emphasis to regenerative and direct conversion receivers, and to simple transmitters as would typically be built by a novice. Building has another advantage; it makes attaining AOCP level much easier if one has practical constructional experience.

The problem with multiple choice questions, while easy to mark, is that anyone can get 20-25 percent just by ticking boxes without knowing anything about the questions! Similar questions need to be retained bit with chance playing a smaller part. Nevertheless, the purpose is not to test the literary ability of the candidate. Five or so questions worth say two marks could be such as: draw a Yagi for six metres with four elements — quote approximate dimensions, or sketch a circuit diagram of a 12 volt power supply using a bridge rectifier, or draw a circuit diagram of a code practice oscillator, etc.

Now, we get to that controversial subject of Morse code examinations. It is vital to have a Morse code examination for HF amateur operators. Despite automation, the Morse code mode still has the following advantages over any other mode in existence, such as:

— low cost
— simplicity of transmitting equipment
— penetration through interference
— more "miles-per-watt"
— narrow bandwidth
— speed (at a reasonable sending speed and using abbreviations. If you still doubt me, listen to some long-winded SSB QSOs on 80 metres)
— most importantly of all — fun.

Even if WARC-92 removes the Morse requirement for operations below 30 MHz, I think the WIA and its members should lobby for the retention of NAOCP and AOCP Morse tests. Suppose there is an emergency aboard a ship and the only mode available is Morse code. The ship's transceivers have broken down and only amateur equipment is operational. The radio operator (an amateur) hears a SSB net, so breaks in using CW. If all operators knew Morse code, they could inform the authorities and handle the emergency as any amateur would be obliged to do. If no one on the net knew Morse — which could happen if the Morse examinations were removed — there would be, at best, a mad rush to find amateurs who can read Morse. As a result of this inefficiency, lives could be lost. At worst, the message could be ignored completely.

RECIPROCAL LICENCES

On to the question of reciprocal licences. The practice of Japanese novices — of a lower technical standard than our own — being allowed to operate on VHF is blatant discrimination against our own novices. Rather than allowing their novices on two metres we should cancel the reciprocal agreement!

If an Australian novice wants to operate on HF in Britain, he/she cannot because the United Kingdom do not have a novice licence. (Their only HF licence has 12 words per minute Morse and theory equivalent to our AOCP). The same should apply to Japanese novices in Australia. We should not change our licensing system to suit another country.

Another benefit of this proposed novice licence and its consequent "building boom" will be for component availability to improve from its present woeful state. This will benefit all amateurs. As VK4BMD says in his superbly written letter in AR, September 1987, we should remember our hobby is essentially a scientific hobby and as our name suggests "The Amateur Service" we should serve the community — not only through WICEN and ATN, but indirectly by contributing to science. We should not behave as a glorified CB service or we will, in the future, have only two bands — 27 MHz and 477 MHz! Our other bands will have succumbed to commercial interests. A grim outlook perhaps — but not unthinkable.

This next proposal has little to do with amateur radio, but if adopted, could benefit our hobby. I believe the DOTC should authorise a new radio-communications service called the Citizens Data Radio Service. It would be available to any person who pays a licence fee similar to the present CB fees. Similar conditions would apply. As regards the frequency allocation, I have read that it is easy to convert 40 channel 477 MHz CB sets to cover 80 channels. Thus the 40 additional channels could be set aside for the new service. Digipeaters and bulletin boards would be permitted. This proposal was published in AR. Instead of lowering our licence standards to allow these hobbyists to enter amateur radio, they would discover data communications in the easiest and simplest way. I stress that the proposed Citizens Data Radio Service is nothing at all to do with the amateur service, but perhaps a few people who are interested in the radio side of it could become amateurs.

I ask all members who support these proposals to write to, not only the WIA, but also DOTC, who have the final say. Ensure Australia adopts a licensing system which will benefit all — not just a few greedy zealots who want more for less. Remember that many empires/governments fell due to greed on their own part. Let us ensure that amateur service does not suffer the same fate.

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THE CLOTHESLINE MONOBANDER

The Clothesline Monobander is a simple solution for a compact two element 20 metre antenna.

Ron Bell VK3MB
Harkaway, Vic. 3806

THIS ANTENNA IS a simple solution to the antenna problem, being a compact two element array. It does, in fact, use the same hardware and manual rotating system as that shown in AR, March 1986, page 55. The latter antenna worked satisfactorily until the loading coils in the centre of each element became loaded with water the SWR went into orbit and the efficiency took a dive the other way.

I had used the VK2ABQ tribander (AR, July 1981, and earlier) and found it a satisfactory antenna but wanted a simple monobander which I could feed with 300 ohm open wire line without the necessity of having a balun up-top.

The dimensions are the same as those in the tribander of VK2ABQ, but the fed element is a folded dipole of good quality 300 ohm line (ie the plastic covered type with plastic spacers) and the only balun is on the antenna side of the SWR meter inside the shack, the feed line being the same quality 300 ohms open wire.

I acquired the Hills® clothes hoist head from one of their salvage depots. It was never used for the purpose they intended. As the four arms slope slightly upwards the extensions, consisting of one inch dowel, do the same.

This means that, when the antenna wires are tightened, the whole array, instead of sagging downwards, is pulled upwards and is more rigid.

Rotation is done by rope (no expensive rotators) and one large horizontal pulley of nine inches diameter feeds the rope on to two small vertical pulleys which carry the rope to the bottom of the mast.

The front to back ratio would not set the world on fire, but it has reasonable forward gain and, having two horizontal elements, should radiate with a low angle of fire which I think is equally important.

The vertical tubing of the hoist head slipped easily into the top of a Hills® wind-up lattice television tower, which gives a height of about 35 feet (approximately 11 metres).

The Hills tower is normally made of three section, the top one being steel tubing. This was replaced by the clothesline head which is the same diameter as the original steel tubing.

The clothesline head, so mounted, enables me to build all sorts of antennas and there is no limit to what can be done with this type of boom. It could be used for Yagis, Quads, ZL-Specials and all types of arrays because it is rigid, simple and seems to eliminate one of the main constructional problems of booms in large arrays.

Anyway, it at least creates the opportunity to experiment, something I do not seem to have much scope in doing these days, in the era of commercial equipment!

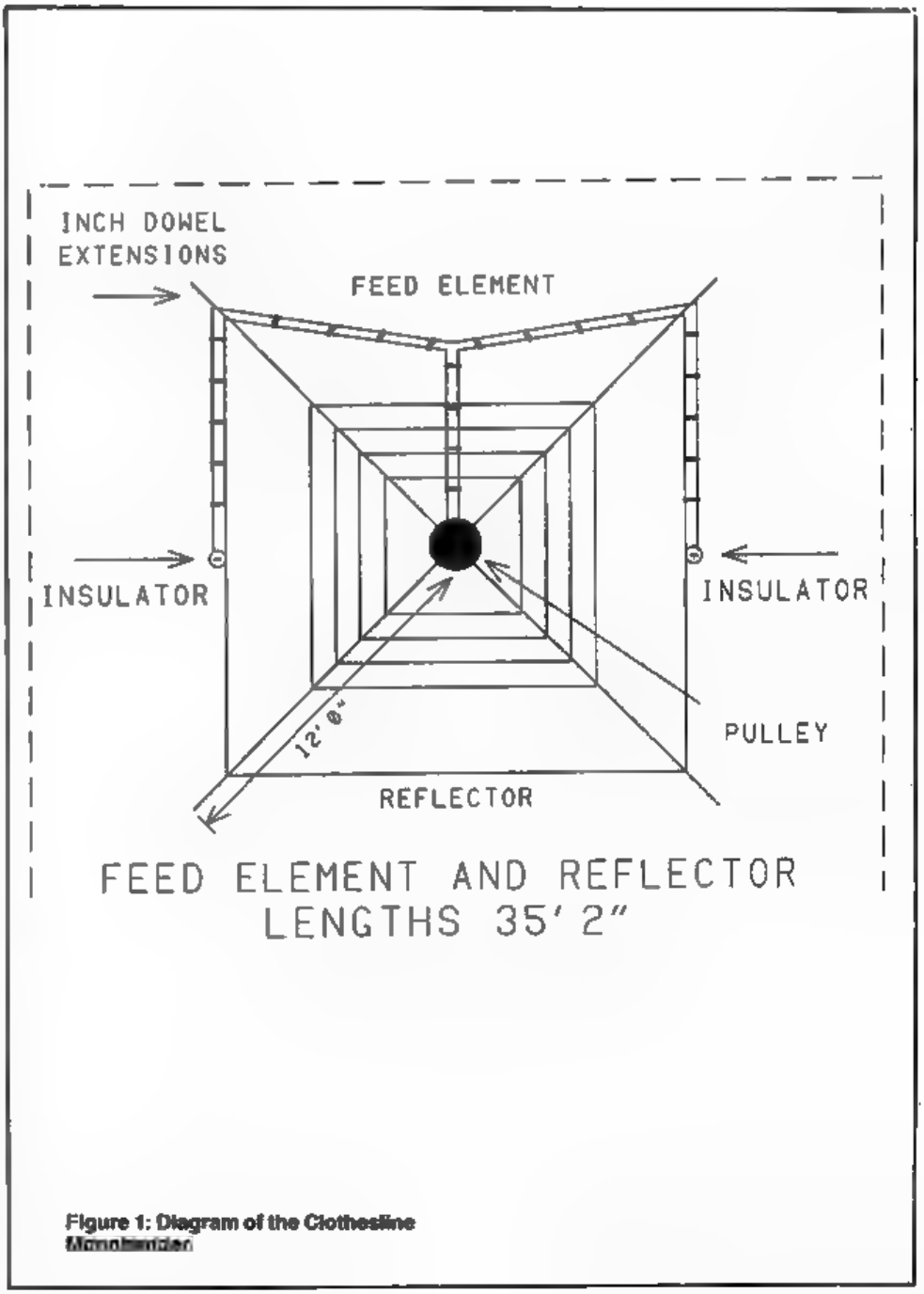

Figure 1: Diagram of the Clothesline Monobander.

Novice Notes

MEASURING SMALL COILS AND CAPACITORS WITH A DIP METER

Drew Diamond VK3XU
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Most of us can measure the usual qualities of voltage, current, resistance and frequency to a sufficient accuracy for our purposes, but inductance and capacitance measurements are a little more difficult if access to an LCR bridge is not available.

To the radio experimenter, the dipper (old term: GDO — Grid Dip Oscillator) after the multimeter, must be about the most useful tool around. There have been numerous books and articles written about applications for the dipper (see bibliography). What I would like to do here is go over one of the applications that does not appear to have had the coverage it deserves, that of L and C measurement.

The problem of simple capacitance measurement has been solved in recent years, and a number of meters have appeared in local journals (typical example Reference 2). However, for small capacitances and inductances of the size used in tuned circuits and filters, our dipper also offers a solution.

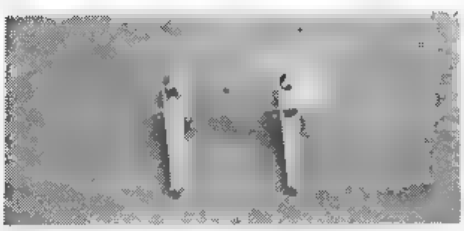
If the calibration of the dipper is reasonably accurate, and hence by measuring the frequency at which a known value of L and C resonates with an unknown C or L, the value of the unknown can be determined.

With a "standard" high-stability capacitor of 100 pF and a home made inductor of five microhenries, we can make measurements of good accuracy using the chart in Figure 1.

THE CAPACITOR

The ideal capacitor would be a silver mica of one or two percent tolerance, but as these are now practically impossible to buy, a very good alternative is a polyester or "styroseal" capacitor. I bought a quantity of these and found them all to be well within two percent of 100 pF. As this capacitor may be applied to coils of various physical constructions, it would be a good plan to mount it on a strip of insulating material such as perspex as shown in Photograph 1. Two alligator clips have been fixed to the perspex to allow easy connection to a variety of coils.

Photograph 1: The "standard" capacitor.



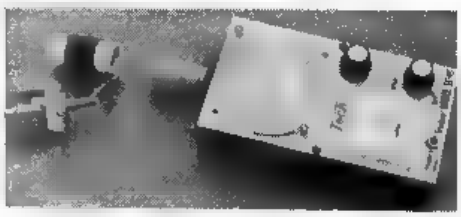
Photograph 2: The "standard" inductor.

THE INDUCTOR COIL

Once the capacitor has been obtained; the coil may be tackled. Obtain a piece of insulated tube 20 millimetres outside diameter and 45 millimetres long (eg. electrical PVC conduit). Drill two 1.3 millimetre holes (1/16") centrally located right through the diameter of the former spaced 22 millimetres. Onto this must be wound exactly 19 turns of number 18 B & S (one millimetre diameter) enamelled copper wire. Two alligator clips should be attached as for the capacitor. See Photograph 2. Check the inductance by coupling the dipper coil to the standard coil. The coil and capacitor combination should resonate at 7.1 MHz, indicating that the coil has an inductance of five microhenries. If the frequency is too low; carefully remove a turn or two as required. If the resonant frequency is too high; it will be necessary to wind the coil again, but adding perhaps another turn. If your coil former and wire is as specified, you should not have to make any adjustments.

SOME TYPICAL EXAMPLES

Most capacitors are marked with their value, but as is well-known, the markings are sometimes indecipherable, or have been rubbed off. If you estimate that the capacitance is somewhere in the range between two to 1000 pF; then it should be possible to find the value. Connect the capacitor across the coil, then couple the dipper (about three centimetres distance to begin) to the coil so that their axis are common. Starting from the lowest frequency available; sweep the dipper through each range until a dip is obtained, use the least amount of coupling necessary to obtain a visible dip, then read off the frequency indicated on the dipper. The value of the capacitor can then be looked up on the chart. Photograph 3 shows the coil and dipper being used to find the maximum value of a variable capacitor (plates fully meshed).



Photograph 3: Using the dipper to find the value of C.

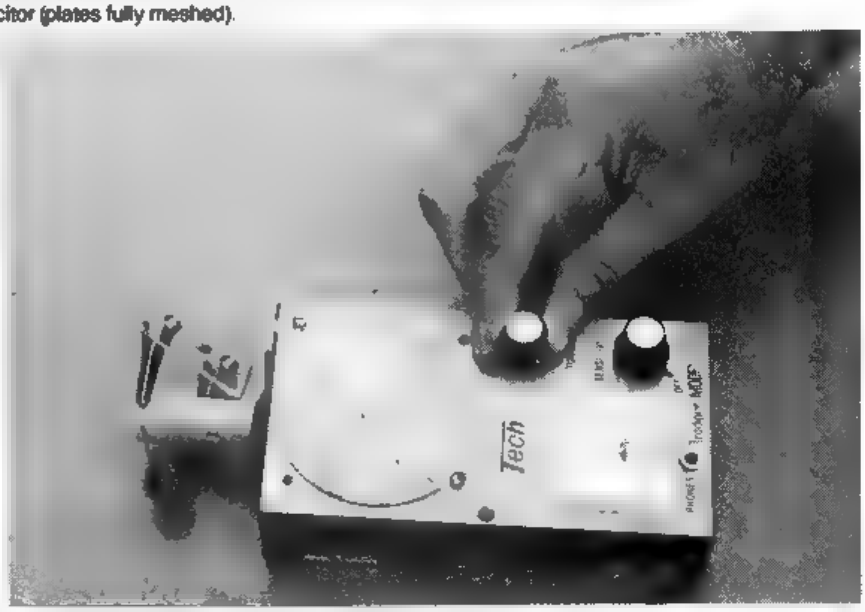
The 100 pF standard capacitor may be similarly employed to find the value of an unknown inductor. As some idea will usually be held as to the value of the inductance; it should not be necessary to sweep a wide frequency range for a dip. Once again, use the smallest coupling necessary for a visible dip.

Toroidal coils may be dipped by inserting the dipper coil between the two leads of the toroid as shown in Photograph 4.

There is a trap when making resonance measurements. It is possible for a harmonic of the dipper frequency to be read by mistake, so it is good policy to check again at multiples of the frequency first obtained. If the dip is more pronounced at a multiple of the first frequency; then the second reading is the correct one.

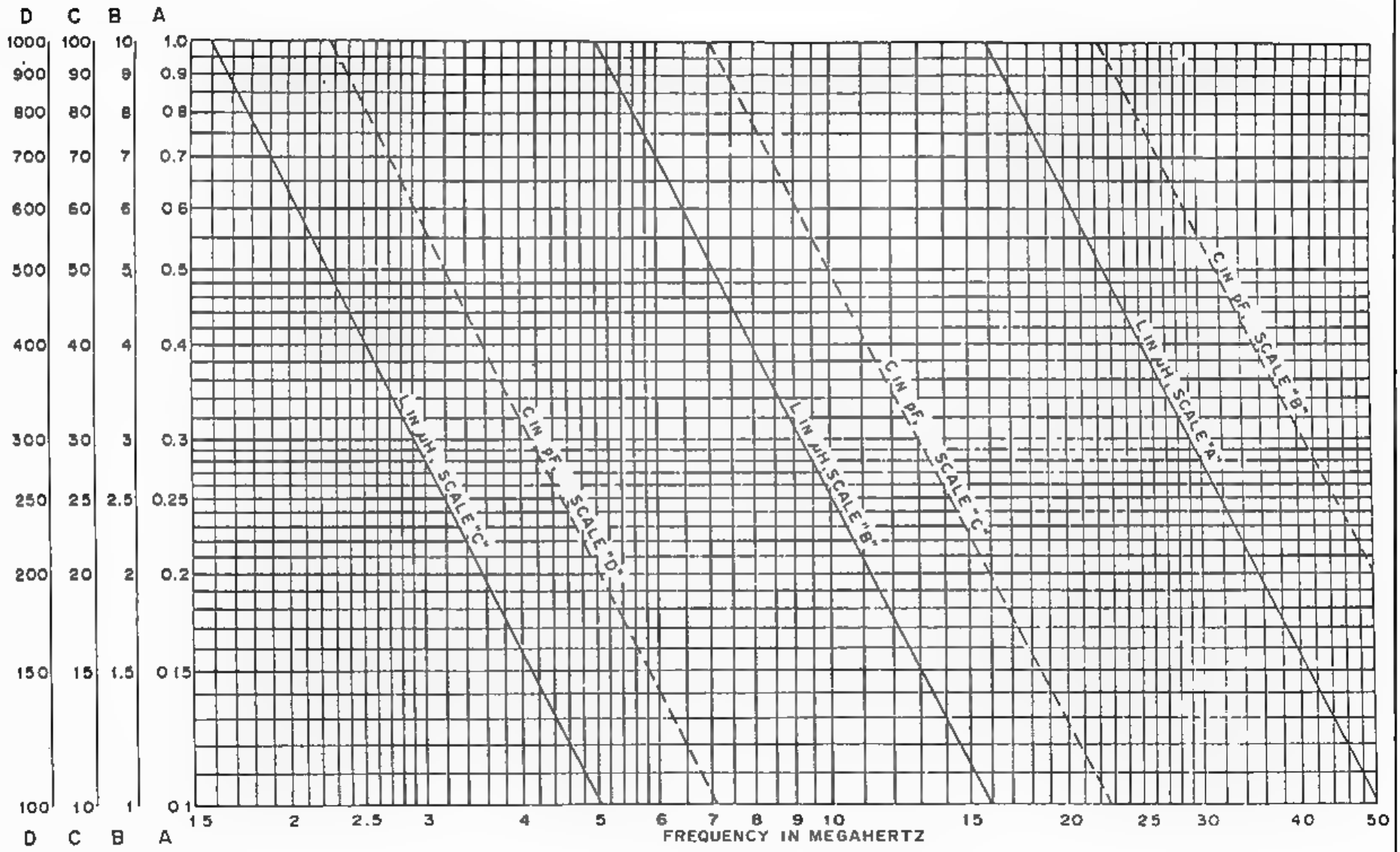
References and Further Reading

1. LENK. Servicing with Dip Meters. *Foulsham-Sams 65-19117*
2. SWAIN & LEVIDO. Digital Capacitance Meter. *Electronics Australia magazine, August 1985.*
3. *ARRL Amateurs Handbook, ARRL.*
4. *Radio Communication Handbook, RSGB.*
5. BAILEY. FET Dip Oscillator Mk II. *Radio Communication, April 1987*



Photograph 4: "Dipping" a toroidal coil.

Figure 1: Chart for determining unknown values of L and C in the range of 0.1 to 100 μH and 2 to 1000 pF, using standards of 100 pF and 5 μH.



INTERNATIONAL

BEACONS

The frequency of 21 150 MHz has been chosen by the International Amateur Radio Union (IARU) for a world-wide network of beacons to indicate propagation and band conditions.

A similar network is operating on a 14.100 MHz and another is planned for 28 MHz.

The current International Beacon Project on 28.190 to 28.300 MHz will remain until December 31, 1989.

After then the segment 28.190 to 28.200 MHz will have beacons on a timed-shared system, while the segment 28.200 to 28.225 MHz is reserved for use by continuous duty beacons.

The 14.100 MHz beacons sponsored by the Northern Californian DX Foundation (NCDXF) use a single frequency on a time-shared basis.

This practice will be applied to those on 28.190 to 28.200 MHz from January 1, 1990, and the reserved 21 150 MHz channel at a future date.

Eventually the 10, 15 and 20 metre world-wide time-shared networks could each have 15 stations — and the IARU was hopeful they would be co-sited.

The NCDXF effort was well funded and is understood that the initial group consisted of wealthy radio amateurs at a time when income tax was very high and contributions to causes with a scientific content could be tax-exempt.

It now functions as a world-wide club funded by membership subscriptions and remains based in San Francisco.

The nine stations in the NCDXF network use similar equipment comprising a TS-130S transmitter and control unit which provides timing based on a quartz clock.

Each transmits for about 58 seconds in a sequence around the clock. The order is arranged to run from east to west beginning with New York on the hour, and the sequence is repeated at 10 minute intervals.

The beacons transmit in A1A mode, identifying with a call sign. They run at 100 watts for nine seconds, then reduce power in nine second steps to output 10 watts, one watt and 0.1 watt, before sending SK and call sign at 100 watts.

NCDXF 20 METRE BEACONS IN TRANSMITTING SEQUENCE

4U1UN/B	New York
W6WX/B	Standford University
KH6O/B	Honolulu
JA2IGY	Isa City
4X4TU/B	Tel Aviv University
OH2B	Helsinki University
CT3B	Funchal
ZS6DN/B	Pretoria
LU4AA	Buenos Aires

10 METRE BEACON LIST

28.050	PY2GOB	Sao Paulo
28.175	VE3TEN	Ottawa
28.195	IY4M	Bologna
28.200	GB3SXE	Crowboro
28.200	KF4MS	St Petersburg
28.2025	ZS6BHF	Durban
28.2005	LOIGI	Mt Predigtstuhl
28.2075	W8FKL	Venice Fl
28.208	WA1IOB	Marlboro Mass
28.210	K4KMZ	Elizabethtown Ky
28.212	ZD9GI	Gough Island
28.212	EA6RCM	Palma Majorca
28.215	GB3RAL	Slough
28.215	LU4XI	Cape Horn
28.217	WB9VMY	Oklahoma City
28.220	5B4CY	Zyyi
28.222	W9UXO	Chicago
28.2225	HG2NHA	Tapolca
28.2275	EA6AU	Palma
28.230	ZL2MHF	Mount Climie
28.232	W7JPI	Sonoita Az
28.232	KD4ECK	Jupiter
28.235	VP8BA	Southampton
28.2375	LA5TEN	Oslo
28.2400	OA4CK	Lima
28.240	5Z4ERR	Kiambu
28.2425	ZS1CTB	Cape Town
28.242	LU4FM	Rosario
28.245	A92C	Bahrain
28.247	EA3JA	Barcelona
28.248	K1BZ	Belfast Ma
28.250	Z21ANB	Bulawayo
28.250	4N3ZHK	Mount Kum
28.252	WB4JHS	Durham NC
28.255	LU1UG	G/ral Pico
28.257	DK0TEN	Konstanz
28.262	VK2RSY	Dural
28.264	VK6RWA	Perth
28.266	VK6RTW	Albany
28.268	VK8VF	Darwin
28.2685	W9KFO	Eaton Ind
28.270	ZS6PW	Pretoria
28.270	VK4RTL	Townsville
28.272	9L1FTN	Freetown
28.275	AL7GQ	Jackson Miss
28.277	DF0AAB	Kiel
28.280	YV5AYV	Caracas
28.281	VE1MUF	Newfoundland
28.284	VP8ADE	Adelaide Island
28.286	KA1YE	Rochester NY
28.287	W8OMV	Ashville NC
28.287	H44SI	Honiara
28.288	W2NZH	Moorestown NJ
28.290	VS6TEN	Mount Mutilda
28.292	LU2FFV	San Jorge
28.295	WB8UPN	Cincinnati Ohio
28.296	W3VD	Laurel Md
28.295	WB4JS	Fort Lauderdale
28.299	PY2AMI	Sao Paulo
28.300	ZS1LA	Stillbay
28.315	ZS6DN	Irene
28.888	W9IRT	Hollywood
28.890	WD9GOE	Freeburg Ill
28.992	DL0ANN	Moritzberg

Some 10 metre beacons operate continuously whilst others are intermittent.

VK2RSY has become AX2RSY during Australia's bicentenary year and includes a special bicentenary message which recently received a reception report from the United Kingdom — *who said 10 metres is dead? ? ?*

This article was mostly adapted from The International Beacon Project report in the journal of the IARU Region 3 Association by Alan Taylor G3DME, IARU IBP Co-ordinator, with additional information on the NCDXF and AX3RSY

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AUSTRALIA AT A GLANCE

During our bicentenary year, many contacts will be made on the DX bands, particularly in view of the special AX prefix and VI88 commemorative call sign stations. The following summary may help radio amateurs to speak more authoritatively about their country.

THE LAND: Australia covers 2 966 200 square miles (7 682 300 square kilometres) about the size of the continental United States of America. It is the world's oldest continent, having split from Antarctica and South America about 60 million years ago.

MAJOR CITIES: Melbourne, Sydney, Adelaide, Brisbane, Perth and Darwin — are all coastal except Canberra, the Federal Capital.

There are six States. New South Wales, Victoria, Queensland, South Australia, Western Australia — all on the mainland, and an island State, Tasmania.

These former British colonies formed the Commonwealth of Australia when they federated in 1901.

Australia has two interior Territories — Northern Territory and Australian Capital Territory.

The interior, known as the outback, is virtual desert. Queensland State, in the north-east, has tropical rain-forests.

Australia's external territories include several offshore islands — Norfolk Island, Cocos (Keeling) Islands, Christmas Island and the Coral Sea Islands, as well as land claims to 48 percent of Antarctica.

The country has much flora and fauna not found elsewhere, including the kangaroo and emu (both on Australia's coat of arms), koala and the platypus.

THE PEOPLE: Indigenous Aborigines, now numbering 160 000 or one percent of the population, are believed to have been in Australia for at least 40 000 years.

New South Wales was settled mainly by British convicts in 1788, followed by thousands of free settlers.

The population now numbers 16 million people. There was massive post-war immigration since 1945, and an estimated 20 percent of the population is overseas born.

HISTORY: It was believed that navigators from South-East Asia visited the Australian continent many centuries ago. Spanish and Portuguese navigators visited Australia in the 16th century, followed by the Dutch in the 17th century.

Settlement followed the exploration of Australia's east coast by British explorer, Captain James Cook in 1770.

Australia was first roughly shown on a 1597 Dutch map. The Cook expedition was an important part of Australia's history because it gave the first reports of a fertile country.

Arthur Phillip arrived at Botany Bay in command of the First Fleet and founded a convict settlement at Sydney Cove on January 26, 1788, the day now celebrated as Australia Day each year.

THE ECONOMY: Australia's economy is centred on primary industries, mostly mining, sheep and agriculture. It is a major exporter of beef, lamb, wool, and wheat. Also, it has major mineral deposits, including some of the world's biggest reserves of uranium.

Contributed by Jim Linton VK3PC

NEW COMPLEX — KOSMOS — 1861

by A P Papkov
Translated by Dex Anderson W4KM

The short article following originally appeared in the Russian Publication *Sovetskiy Patriot* July 1, 1987. Translation form the original Russian is by Dex Anderson W4KM

Whilst some of the operational details of RS10 and RS11 are not well-known, the comments on the design philosophy to overcome the "Kilowatters" may be of interest.

David Rank n 9V1RH/VK3QV

ARTIFICIAL EARTH SATELLITE "Kosmos-1861" was launched in the Soviet Union on June 23, 1987. In addition to navigational systems, equipment for providing radio amateur satellite communication was installed. This equipment, called on-board-radiotechnical complex (bortovoy radiotekhnicheskiy kompleks) BRTK-10, was developed by the volunteer space technology laboratory attached to the museum of cosmonautics named after K E Tsiolkovskiy, in Kaluga (situated approximately 170 kilometres SSW of Moscow).

The on-board radio technical complex consists of two analogous sets of equipment, differing only in operating frequencies. One of the sets is assigned the call sign "RS10" and the other 'RS11'.

The BRTK-10 repeater differs significantly from its predecessors. In the first place it now operates multi-band, and in the second, it now operates multi-mode. Most importantly, it no longer has any fear of the "Kilowatters" ('Kilowattniki"), meaning that it does not become overloaded by powerful signals.

Presently, the following repeating operations can be carried out: From the 21 MHz band to the 29 MHz band, from the 145 MHz band to the 29 MHz band, simultaneously from the 21 and 145 MHz bands to the 29 MHz band, from the 21 MHz band to the 145 MHz band, from the 21 MHz band simultaneously to the 29 and 145 MHz bands.

A new, practically unused repeater band, 21 MHz, has been introduced for experimentation by amateurs. We hope this will enable us to introduce an enormous army of radio amateur shortwavers to the fascinating world of space communication, using equipment already in their possession. Repeating from on board the satellite in the 145 MHz band will also encourage the development of mass participation and the technical availability of equipment for space communication.

Finally, we hope to make still better friends of shortwavers and ultra-shortwavers by providing them mixed space communication on a variety of bands.

The repeater frequencies and beacons are allocated as follows:

	RS10	RS11
	MHz	MHz
Earth-to-Space	21 160 - 21 200	21 210 - 21 250
Earth-to-Space	145.860 - 145.900	145.910 - 145.950
Space-to-Earth	29.360 - 29.400	29.410 - 29.450
Space-to-Earth	145.860 - 145.900	145.910 - 145.950
Beacon 1	29.357, 145.857	29.407, 145.907
Beacon 2	29.403, 145.903	29.453, 145.953
Earth-to-"Robot"	21 120, 145.820	21 130, 145.830

A future issue will tell about telemetry information transmitted by the beacons, but for now a few words about the repeater being "fearless" as far as powerful signals are concerned, and about its other qualities.

As is known, a station wishing to ensure a dependable contact will instinctively increase the power of its signal, thereby overloading the repeater channel and the output channel of (the repeater's ? ? ?) transmitter and preventing other stations from communicating. That is how it was with the repeaters on the earlier satellites. Avoiding this shortcoming turned out to be not such a simple matter. If an ordinary automatic gain control (in Russian ARU — avtomaticheskaya regulirovka usileniya) were made, the effect would be the same — the powerful signal would decrease the gain ration of the repeater and would also prevent others from communicating.

We had to get a bit clever and make 10 independent AGC systems, using filters to divide the full repeater bandwidth into 10 segments. We do not hide the fact that the system turned out to be complicated, we agonised over it a great deal. But, there is no limit to what we would do to raise the quality of communication available to our friends, the radio amateurs! In addition, we raised the power of the transmitters to five watts and we can vary the amplifier gain of the repeaters within broad limits and set the repeater bandwidth, by command, equal to 16, 24 or 40 kHz. For "Retro-style" amateurs (meaning unclear, old-fashioned? ? ?) we have left the old repeater system with its common bandwidth and all of its defects and merits.

The automatic answerer "Robot-4" does not differ in the algorithm and for conducting contacts from the analogous ones installed in the "Radio-5 and Radio-7" satellites. Its log memory has been increased and the readout system from this memory has been changed. The memory capacity for circular announcements from the bulletin board has also been increased, as has the system for entering information into this memory. ■

VHF UHF — an expanding world

Eric Jamieson VK5LP
8 West Terrace, Meningie, SA, 5264

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.005	H44HIR	*Honiara*
50.005	ZS2SIX	*South Africa*
50.010	JA2IGY	*Mie*
50.022	ZS6PW	*Pretoria*
50.050	ZS6DN	*South Africa*
50.075	VS6SIX	*Hong Kong*
50.075	ZS4SA	*South Africa*
51.020	ZL1UHF	*Auckland*
52.013	P29BFL	*Port Moresby*
52.100	ZK2SIX	*Niue*
52.200	VK8VF	*Darwin*
52.250	ZL2VHM	*Manawatu*
52.320	VK6RTT	*Wickham*
52.325	VK2RHV	*Newcastle*
52.330	VK3RGG	*Geelong*
52.345	VK4ABP	*Longreach*
52.350	VK6RTU	*Kalgoorlie*
52.370	VK7RST	*Hobart*
52.420	VK2RSY	*Sydney*
52.425	VK2RGB	*Gunnedah*
52.432	VK0MA	*Mawson*
52.435	VK3RMV	*Hamilton*
52.440	VK4RTL	*Townsville*
52.445	VK4RIK	*Cairns*
52.450	VK5VF	*Mount Lofty*
52.460	VK6RPH	*Perth*
52.465	VK6RTW	*Albany*
52.470	VK7RNT	*Launceston*
52.485	VK8RAS	*Alice Springs*
52.510	ZL2MHF	*Mount Climie*
144.022	VK6RBS	*Busselton*
144.400	VK4RTT	*Mount Mowbullan*
144.410	VK1RCC	*Canberra*
144.420	VK2RSY	*Sydney*
144.430	VK3RTG	*Glen Waverley*
144.445	VK4RIK	*Cairns*
144.445	VK4RTL	*Townsville*
144.465	VK6RTW	*Albany*
144.470	VK7RMC	*Launceston*
144.480	VK8VF	*Darwin*
144.485	VK8RAS	*Alice Springs*
144.550	VK5RSE	*Mount Gambier*
144.565	VK6RPB	*Port Hedland*
144.600	VK6RTT	*Wickham*
144.600	VK5VF	*Mount Lofty*
144.950	VK2RCW	*Sydney*
144.950	VK3RCW	*Melbourne*
145.000	VK6RPH	*Perth*
432.066	VK6RBS	*Busselton*
432.160	VK6RPR	*Nedlands*
432.410	VK1RBC	*Canberra*
432.420	VK2RSY	*Sydney*
432.440	VK4RBB	*Brisbane*
432.445	VK4RIK	*Cairns*
432.445	VK4RTL	*Townsville*
432.450	VK3RAI	*Macleod*
432.540	VK4RAR	*Rockhampton*
1296.198	VK6RBS	*Busselton*
1296.420	VK2RSY	*Sydney*
1296.445	VK4RIK	*Cairns*
1296.480	VK6RPR	*Nedlands*
10300.000	VK6RVF	*Roleystone*
10445.000	VK4RIK	*Cairns*

A letter from Ron Cook VK3AFW, confirms the operation of the VK3RTG beacon, which is helpful as I have often wondered about it. Ron says he is surprised it has not been heard in VK5 recently. At my previous QTH of Forreston, I only ever heard it once during a big opening, but must admit I have not looked for it very often from Meningie. Since the letter arrived I have checked several times, but heard nothing.

BEACON OPERATION

On the question of confirming what beacons are actually operating, the list has been cleaned up quite a bit of late.

VS6SIX is confirmed as being on by *SMIRK Six Shooter* and the Japanese *CQ ham radio* magazine. H44HIR confirmed by FK1TS. VK8VF on six metres at least is reported from Japan. Presumably the two metre beacon is also operating. VK4ABP from Longreach has been heard here, also VK2RGB. VK3RTG is confirmed by VK3AFW (above).

I would be pleased to hear from any readers who can confirm whether the following beacons are operating

50.010 JA2IGY	144.480 VK8VF
52.100 ZK2SIX	144.565 VK6RPB
52.250 ZL2VHM	432.535 VK3RMB
52.350 VK6RTU	10300.000 VK6RVF

If the above can be confirmed, the checking of the list will be complete and this should then be the most up-to-date beacon list available. I am grateful to all those who have replied to my requests so far.

For a six metre beacon, VK3RMV on 52.435 at Hamilton, is incredibly reliable here at Meningie. It is always audible, sometimes just above the noise level, rising to a peak of S5 during periods of propagation enhancement. The distance is about 350 kilometres which is quite a long way for consistent six metre operation. I find it a very useful beacon for band conditions and is monitored regularly. It also indicates my trusty old six element wide spaced (25 foot boom) Yagi is working well and is some compensation for the inability to have the use of my former eight-over-eight Yagis due to space considerations. The eight-over-eight was a superb device.

SIX METRES

Long distance operation is on the way! Graham VK6RO, phoned me to say firstly that the band was open from VK6 to VK5 on Saturday 27/2. Then on 1/3 he worked JF6MLU, at 1135 on 50.110 with signals 5 x 2/3. He had been hearing the Russian television on 49.750 MHz on and off for a few days so was not surprised at the nighttime TEP contact. The solar flux at the time was 102.

Then on 10/3, I received an excited phone call from Peter VK8ZLX, in Alice Springs, at 0940, to say he had been working JAs since 0330, mainly the long distance stations in JA7 and JA8 with signals to S9+. The JAs were also looking for Hong Kong stations as they could hear the beacon there. At the time of the phone call, Peter said a few JA2 stations were just becoming audible, so the distance was shortening, although the others were still there. Signals were mostly around 50.110 MHz.

A further phone call from Peter VK8ZLX on 12/3 said he had been working JAs from 0530 to 1030 again with very strong signals and from JA2, 5, 6 and 8, so he had a mixture of afternoon and evening TEP, again around 50.110 MHz. The JAs were also getting into Perth and had worked VK6KXW and VK6KRC.

Peter also reported having a contact via RTTY JA1VOK and JR2RCB were set up for packet radio on 52.500, but Peter said he had not been able to make a contact so far. (The MUF probably has not risen that far for TEP contacts yet. — 5LP).

With the increased awareness of the capabilities of six metres as a result of the very good Cycle 21, there are more operators world-wide being vigilant so it is very likely we will be having long distance contacts by TEP or F2 earlier than may be expected. The climb out of the low part between cycles is often quite rapid compared with the slower decline on the downward side.

SIX METRES FROM THE US

A copy of the SMIRK newsletter *Six Shooter* has arrived on my desk, the first for some time due to the cost of production and the failure of many members to pay their membership dues! SMIRK membership now stands at 5300 in all 50 US States and 86 other countries.

SMIRK takes issue with the continuing use (mainly in the US) of 50.110 MHz for other than DX contacts and is trying to clear the frequency for world-wide DX use. It is being accepted world-wide as the international SSB calling frequency and SMIRK says '***If you are not looking for foreign DX you should not be there.***' The same could be said for operation in Australia, but with our restrictions on the use of 50 MHz there is only limited use of the frequency, except in VK6 and VK8. Hopefully, they are not using the frequency for local chatter or Es contacts.

The 13th Annual SMIRK Party Contest will be held from 0000 UTC on June 18 to 2400 UTC June 19, 1988. Exchange call sign, SMIRK number and grid square. Crossband, multi-operator or partial contacts are not permitted. Count two points for each SMIRK contact made and one point for each non-SMIRK contact. Total SMIRK score plus total non-SMIRK score, multiplied by the total number of different grid squares worked to give the Claimed Score. Entries must be on the new log sheets. Send your log requests (return postage required) and contest entries not later than July 8 1988, to Lisa Lowell KA0NNO, PO Box 647, Hugo, Colorado, 80821 USA.

SMIRK also reports in the Pacific segment, that Japan, during their last summer, had one of the best Es seasons for many years. Yoshi JA1UT reports on his BV2A/B operation from Taiwan. From June 5 to 11 they worked 1663 stations, working 1010 on June 7 alone. They also worked four HL stations on that date. On June 8, they worked KG6DX for the first BV to KG6 QSO ever on six metres! HL9TM (W7KMA) had the first BV to HL contact.

From the US East Coast, K1TOL reported the super opening on June 7, and across the Atlantic worked EI6AS, GW3WS, GM3TXX and CT4KQ, running 10 watts! The GB3SIX beacon was heard on 50.020 MHz.

Norway has gained a 50 to 52 MHz allocation with a maximum of 60 watts ERP with temporary restrictions on those stations within 100 miles of the remaining television stations which are due to close before long. F8SH and F9LT are part of a group trying to obtain some operating privileges, even if on a restricted scale, for French amateurs on six metres.

Several stations on the island of Malta are authorised to work six metres, two being Paul 9H1BT and 9H1CG. They can operate with 10 watts from 50 to 52 MHz. A beacon signing 9H1SIX on 50.085 MHz, is being constructed by Paul G4UJE.

Norway has 25 six metre permits issued. The OZ (Danish) group are working hard to get a six metre allocation. CT has six licences. The ZB2VHF beacon on Gibraltar is said to be still active. In Italy, I5TDJ will apply for a permit to work Cycle 22. The DL (German) stations have not much hope for six metres due to US military police using six metres,

also the East Germans use the band for military operations too. Active crossband 10 to six metres stations are to be found in Sweden and Finland, also Austria and Rumania. Overall, there is a fair spread of poss bie activity for Cycle 22.

To finish the report from the SMIRK newsletter, K2YOF during their last summer (May to August 1987) said he worked or heard CT4, C6A, EI9, FM, FY7 (beacon), G, GM, GU, GW, HH7, HK1, KP2, KP4, OX3 (beacon), VO2, VP5, V2A, XE1, YS1, YV0, ZF2, 4U1 and 8P6. Others in his area also reported C3, GI, GJ, HI8, KH6, LA and 9H1. Most, if not all, were probably worked on Es, but what a tally of countries!

It will be interesting to see how the Es season behaves in the Northern Hemisphere summer which will be starting soon after you read these notes. Will they have an early good lead-up and then collapse like the Southern Hemisphere? Incidentally, the Es collapse appears to have been common right across the Southern Hemisphere.

THE WORLD ABOVE 50 MHz

From Bill Tynan W3XO, and his column *The World Above 50 MHz* in *QST* for March 1988:

"Sporadic-E is the big story this month. Although we are accustomed to a spurt of Es around the winter solstice, this year's mini-season seemed to be better than most. It even featured a number of excellent two metre openings.

"Propagation was outstanding, particularly during the week preceding Christmas. W3XO worked XE1GE at 0100 on 19/12. K5NZS reported Central American stations YS1ECB and TI1HL, while W5FF had a great opening on the evening of 19/12 working KP4, KP2 and HH7PV.

There is good news from the Netherlands. From the RSGB's VHF/UHF newsletter comes the word that, from March 1 and running for five years, Dutch amateurs will be permitted to operate on six metres, using CW only with no more than 30 watts output and between 50.000 and 50.450 MHz. Unlike the UK, there are no restrictions as to ERP.

However, as the six metre operation is on a non-interference basis, the Dutch National Society, VERON, is recommending the use of low gain antennas.

Also, from the RSGB monthly magazine *Radio Communication* is word of G4MAB being assigned to Ascension Island in the South Atlantic where he will be operating as ZD8MB and plans to establish a beacon on 50.032 MHz."

QUEENSLAND REPORTS

Gordon VK4KAL writes to say "It was a lousy six metre season last Christmas period. I only worked about 10 stations and all from JA! I either missed out completely on the 'locals' or came on the air as the band folded. However, I have monitored ever since on 50 MHz up and on 18/2 it came good to JA for about three days from 0530 on 50.110 MHz with signals to 5 x 9 plus. Signals were heard up to 50.200 MHz.

"Two metre activity was definitely not on either. Harry VK4LE has had a few good two metre SSB contacts with Bill, VK4LC, and a couple of the Brisbane stations during the week ending 10/3.

"The Central Highlands Amateur Radio Club now have a two metre repeater about 60 miles from here which now enables all members to have some form of contact as we are very scattered, some up to 300 miles apart."

Gordon is also experimenting on 432 MHz with a pair of 13 element Yagis. Thanks for your letter, Gordon.

FROM SOUTH AFRICA

Hal Lund ZS6WB, has sent another copy of *VHF News* which contains some information which could interest Australian VHF operators.

"With the opening of the 28.3 to 28.5 MHz portion of the 10 metre band to the US Novice and Technician Class licensees, 28.385 has been adopted as a second six metre co-ordination frequency supplementing 28.885 MHz. Apparently JAs and other Pacific DXers are already using 28.385 MHz for co-operation.

"The Es season that started out so well in December has quietly died with no recent activity. An interesting report from ZS1LA lists a 1 hour 45 minute opening on December 12, 10 minutes on 13/12, 35 on 17/12, 10 on 19/12 and 15 minutes on 24.12!

"The six metre DX calling frequency is 50.110 MHz; six metre SSB 50.200 and FM 51.400 MHz."

THE COLD SOUTH

I have not heard anything from Mark VK0AQ since the telephone call between us some time ago which indicated he could be leaving Mawson about mid-February, then calling at Davis to pick up David VK0CK, and others before returning to Hobart.

I understand the David VK3DHF is likely to be signing VK0HI, from Heard Island until May 1988 and running a keyer on 52.170 MHz and listening between breaks in the keying cycle.

Read in a newspaper that the Australian Bicentennial Expedition had safely arrived at Cape Hallet and were setting out to scale the so far unclimbed Mount Minto. Beyond that, nothing else at this stage. VK0AT (VK2BXM) would have been calling and listening on 52.050 MHz from his shipboard base, using CW from 1000 to 1100 daily.

THE LOCAL SCENE

Fair warning to all those in the path to the east and south-east from the suburb of Woodville, Adelaide, the QTH of Col VK5RO. There is likely to be a lot more RF coming your way before long as Col takes on a major upgrading of his antenna system. His broken antennas, on which he has done so well in the past, are all to be replaced!

Col has obtained from VK5LP one of the eight element KLM-type antennas which were so successfully used as a stacked pair on six metres, also one of my 13 elements from the stacked pair I had at Forreston for two metres (it requires some repairs but is still okay — I am currently using the other one with excellent results. . . 5LP). On 70 centimetres, Col already sports a multi-element J beam and this is likely to go back on the tower.

From Meningie, I will be very interested to note any differences since, although Col is behind the Mount Lofty Ranges, we have had an extremely good path between us, poor antennas and all. It is no problem for me to work Col with signals to 5 x 9 on all three bands with only a few watts; eg five watts on six metres, three watts or less on two metres and three watts on 70 centimetres and the path distance is over the ranges and around 120 kilometres. I can also work him on two metres with 100 mW.

Col has had considerable success for many years working into Melbourne from his good QTH at Woodville, so we hope the improvements will bring even more success, if for no other reason than much work is involved in such an upgrading of antennas. Of course, such improvements in signals will bring a further 1000 or more television sets within RF range, but then Col is quite adept at making TVI traps! Good luck, Col.

Roger VK5NT, also has been undertaking great improvements in his antenna system. The latest venture is into a pair of eight element Yagis on six metres (like 5LP had) and the results have already been noted giving an increase in signal strength far beyond what can be expected purely on a dB basis for stacking — the lower angle of radiation works incredibly well on long distance stations, particularly TEP and F2. Fortunately, with so much land around him, Roger can test antennas by having former antennas still in the air to give a direct comparison — the only way to go.

Roger is extremely strong here in Meningie, no matter where our beams are, on all bands. I presume I am the same on Mount Wilson!

BEACONS IN VICTORIA

Just as I was finishing off these notes, I received a letter from Gordon VK3XX, with up-to-date news on the beacon situation in Victoria.

He says "I am responding to your appeal for information on the Melbourne area beacons (AR, November 1987). If I had realised you had received such a negative response from this area I might have written to you 'ere this.

"1. VK3RTG. This beacon is consistently operating on 144.430 MHz with S9 signals to my QTH about 15 kilometres air line from Glen Waverley.

"2. VK3RAI. Is consistently on 432.450 Mhz with an S9+ signal here. However, the keyer has been heard playing up recently.

"3. VK3RMB. Have not heard this beacon at all since it moved off the old frequency. Under favourable propagation conditions it used to be audible and has been heard at up to S9 — but not for several years and never on 432.535, though I have frequently listened for it and not just on that spot frequency. So unless someone from Ballarat can confirm to the contrary, I would say it has never been reinstated.

"4. VK3RGG was conspicuous by its absence on 52.330 for several years. However, over the Christmas/New Year period looking for non-existent Es activity (surprise!) I did hear it with a very weak signal compared with that which I used to hear.

"5. VK3RMV was audible around the same time. It is not audible so frequently now as in the past.

"6. VK3RCW is confirmed as being on, also from Glen Waverley on about 144.950 MHz. It is a CW practice beacon sending random letters and figures on FSK."

Thanks for that information Gordon, and until advised otherwise will remove VK3RMB from the list.

Gordon VK3XX, also says he has been a keen VHF operator for many years but not on FM/Repeaters. The low end of two metres and 70 centimetre activity on SSB must be at an all time low except for one or two well equipped stations.

On two metres, Gordon uses a 1960s home-brew transverter into an 11 element Yagi, and on 70 centimetres, a Microwave Modules transverter into a 13 element Yagi. He says it is a modest installation but has worked into VK5 on both bands.

On 17/2, Gordon reports signals to VK3KUB, near Wangaratta, were S9 on 144.100 MHz and on trying 432.100 MHz, his SSB was 5 x 4 and he copied his 10 watts at S5 on CW though not so good on SSB. He concludes by saying all we need is activity!

The letter from Ron Cook VK3AFW with information on the VK3RTG beacon, also had a paragraph at the end which may interest readers.

Ron says "Regarding low power operation in contests I offer a couple of (Historical) comments. In the days when we had regular VHF field days in VK3, I operated with 35 mW of NBFM on two metres and notched up a respectable score. My best effort was 50 QSOs with less than five watts out on AM. A number of stations built two transistor AM rigs with about 10 mW output. From memory the technical details were as follows.

"The first transistor was bipolar, and used as a crystal oscillator at 72 MHz and doubling to 144 MHz. A dual-gate FET was used as the PA with RF on one gate and audio on the other. There was no audio power amplification, a dynamic microphone and step-up transformer being sufficient to give adequate modulation depth. Distances of 200 kilometres were readily spanned with moderate sized Yagis.

"There needs to be some incentive/challenge to get people out into the field and the re-introduction of multipliers for low power operation should be considered by contest managers and organisers."

Thanks Ron for these comments. Maybe there will be some feedback regarding low power operation.

REFLECTIONS

The comments from Ron Cook VK3AFW, have stirred my memories of the past which now extend beyond 27 years on VHF/UHF.

A rough count-up of stations in VK3 which were worked from the old poor QTH at Forreston indicate a total of over 120 call signs on two metres and many less on 70 centimetres. About 106 of those two metre contacts were made in the days when most stations were using AM, and quite a number were made in the very early days before I managed to build a sufficiently stable VFO for my transmitters, so was confined to crystal control around 144.090 MHz, with two spare crystals if I found other stations on "my" frequency. Others nearby were VK5NW at Crystal Brook on .050, VK5ZKR .060, VK5TN .080, VK5ZEJ (now VK5LP) .090, VK5ZEP .120, VK5ZMW .130, VK5ZKV .140, VK5WV .150, VK5RO .160, VK5ZKA .170, VK5ZDR .180, VK5ZJH (VK5QZ) .190, VK5ZDX (VK5MM) .200, then up the band to VK5ZBR .250, VK5GG .270, VK5ZJD .305, VK5ZMJ .375 and VK5ZSJ on .480. Of course there were many others scattered between these, often selecting a 5 kHz spot. In those days it was often possible to decide whose station it was simply by frequency long before any announcement of call sign was made!

It was possible to run up over 100 contacts into Victoria simply because there were many stations operating on the low end of two metres, either AM or SSB. Repeaters were unheard of, black boxes either non-existent or too expensive to buy. Almost everyone made their own equipment whatever the band, utilising ex-warrime equipment if it could be obtained and modified and stations were spread out over at least 500 kHz, so you did plenty of tuning in those days using mostly a converter feed into an HF receiver (sometimes with doubtful stability and read-out) tuned to 3.5, 7.0 or 14 MHz depending where you got the best bandspread and readout.

There were many stations in western Victoria and most would be on nearly every night. Stations in Melbourne also were almost as easy to work on AM as they are now on SSB. Many contacts were made because stations used to run a carrier for five minutes or more before calling. Those tuning at the other end could often recognise the VK3 by his frequency and knew it was a VK3 because of QSB, and when he called a contact would be made. A well modulated AM signal with high level clipping and filtering and a good noise blanker (or limiter) on the receiver always ensured a high level of contacts being completed. With so many in VK5 and VK3 now being confined to repeaters it is inevitable less contacts will be made on the low end of two metres, so those coming on in recent years will be very hard pressed to amass any great score of two metre contacts between VK5 and VK3 because the stations just simply are not there!

Long time operators will remember some of these call signs which, in some cases, have been changed to full calls.

VK3s — NN, AOS, ARM, UT, ANQ, ZDM, ZCG, ZTN, ATN, ZER, ZEA, ZMS, ZGZ, ZYG, CI, ZEF, ZAX, AXV, VK, XFS, AEJ, ZUC, AKN, UT, AEJ, ASV, AUR, AQR, AKC, AOT, ZNJ, ZBJ, ZCE, ZCK, ZHU, ZMS, ZYP and I could go on and on, page after page, but those mentioned were some contacted during the 1960s. How things have changed, many would never be heard now for a variety of reasons.

What set out to be a couple of paragraphs became somewhat extended, but that is what happens when you let nostalgia take over! Maybe AR would like an article on the subject, one day. I am sure it could be made into interesting reading.

Before closing I would like to mention a telephone conversation I had with Reg VK5QR, who mentioned that he and Wally VK6WG, in Albany, have been having a great time this year with contacts over the 1885 kilometre path on 1296 MHz, 2.3 and 3.4 GHz. They have had occasions when 144 and 432 MHz have only been fair and then found conditions on the other three bands have been very good. Even contacts have been made on 2.3 and 3.4 GHz, when they would have been scratchy on 144 and 432, so the lower bands are not necessarily a guide to conditions higher up. Reg wonders how many contacts have been missed because of believing 432 had to be good before 1296 was good. Likewise, 1296 has to be good before you had a chance on 23 GHz, and so on. Now-a-days, if there is any indication of enhanced conditions they will go straight away to the other three bands much to the chagrin of some of the locals who seek out Wally VK6WG, for 144 and 432 MHz contacts!

On several occasions they have tried to complete the path on 5.6 GHz but to date have not been successful, but Reg believes it is only a matter of time, the right conditions will prevail one day and the distance will be spanned. Good luck.

CLOSURE

That is about all for this month. I have not taken up space detailing the endless contacts which are made on a continuing basis each month between Adelaide and Melbourne on 144 and 432 MHz, and from Mount Gambier to Melbourne where additionally 1296 MHz is being tried. With the present state of the art, the 700 kilometre path to Melbourne is no great problem to bridge for stations with a reasonable location, with probably Roger VK5NY, from his super mountaintop location at Mount Wilson leading the field! Here at Mendingle, I am hopeful of eventually having the Melbourne and other VK3 operators remember I am 10 degrees further south than the path to Adelaide and that 10 degrees can mean several S-points with a sharp beam. But they are learning!

Closing with two thoughts for the month: "Maybe money does still talk but it sounds more like a gasp" and "He who thinks by the inch, and talks by the yard, should be kicked by the foot."

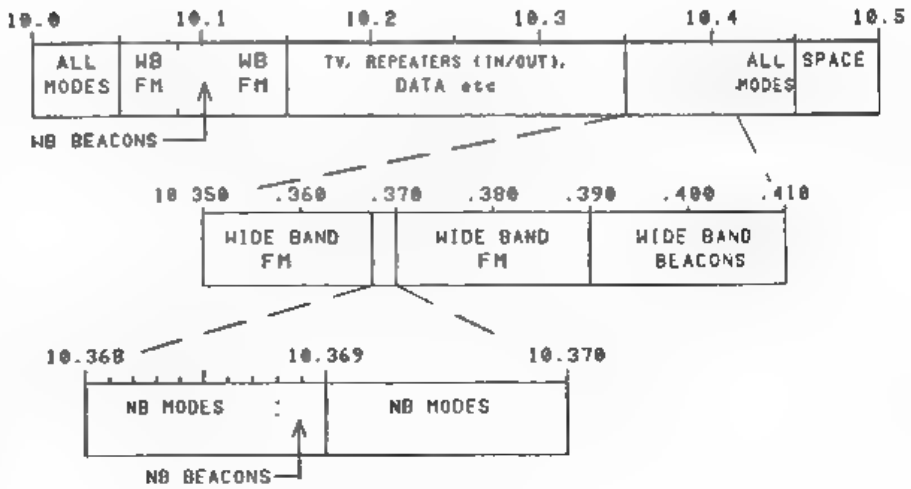
73, The Voice by the Lake

10 GHz Provisional Band Plan

This Band Plan is based upon the United Kingdom Band Plan as notified to the IARU Region 1.

GHz	
10.0000 — 10.0500	All modes
10.0500 — 10.1500	Wide Band FM
10.1000 ±	Wide Band Beacons
10.1500 — 10.3500	Television, Repeaters (in/out), data, etc
10.1500	Packet (1 MHz BW)
10.3500 — 10.4100	Wide Band Modes
10.3900 — 10.4100	Wide Band Beacons
10.3680 — 10.3700	Narrow Band Modes
10.3688 — 10.3690	Narrow Band Beacons
10.4100 — 10.4500	All modes
10.4500 — 10.5000	Space-Satellite Communications

This Band Plan was to be discussed at the 1988 WIA Federal Convention. Please make your views on the plan known to your Divisional Federal Councillor, or write to the Federal Technical Advisory Committee, care of the Federal Office, PO Box 300, Caulfield South, Vic. 3162.



AN AUSTRALIAN SURFACE-PATH UHF RECORD?

A VK6 UHF Surface Path Record?

A VK3 UHF Surface Path Record?

It is one *big thrill* for all VK amateurs, whether they work UHF, VHF, HF or the 600 ohm mode, to hear by 'the grapevine' of the following accomplishments!

Wally VK6WG, an 'Old Timer at UHF' contacted another 'UHF Old Timer', Les VK3ZBJ, on 1296 MHz at 1508 UTC on March 18. The signal report for Wally was 5 x 2. Wally is in Albany, Western Australia, and Les is in Frankston, Victoria — a distance of some 2 500 kilometres. Not bad going boys. Also, in the act was another 'Night Owl' of the spectrum, Roly VK3KXW who is not new to records, but incidentally heard Wally first, nevertheless, Les, with a history of achievements in the hobby and recognised for his knowledge and enthusiasm of the UHF and SHF spectrum, capitalised on the magnificent opening and gave Wally his report. Wally received 429 from Les on CW.

Wally was running 50 watts into a 1.2 metre dish, 16 metres above the ground. Les was running his usual 'rig' on 1296 MHz.

Roly made the grade, and was not disgraced by a couple of kilometres, as he later said, "I am going to 'grab' that two kilometres record from Les, in the future" (Estate agents please take note, all commission to AR, please).

Sincere congratulations to the 'trio' by all concerned, in creating a 'Bicentennial Record' which will grace our history books.

Eric, who has written this column for nearly two decades, and a very popular and deserving winner of the Ron Wilkinson Award for 1987, advised during a quick 600 ohm discussion, that conditions were controlled by a large 'high' between the stations, which was in the vicinity of 1032 hP, and would have greatly enhanced the chance of 1296 MHz communication. The Bureau of Meteorology maps indicate this phenomenon quite clearly.

Roly notched another first for Esperance in Western Australia, when he placed a 1296 MHz CW signal into the shack of Dave VK6AOM at 1527 on March 22. Dave was using a 1271A into a loop Yagi and gave Roly, who was also using a 1271A, but into a 28 element copper loop Yagi, a 569 report.

Roly, continued to fill his log book by contacting Joe VK7JG, on SSB and David VK7DC, using FM and a dipole. Ecstatic with his accomplishments, he also worked VK3MW P Mount Gambier, at 0028 on the 22nd followed by VK6BE, in Albany at 0043, with full quieting on 70 centimetres.

On behalf of the Amateur Fraternity, congratulations gentlemen. The question is *will you update your present record in our Bicentennial Year or rest on your laurels?*

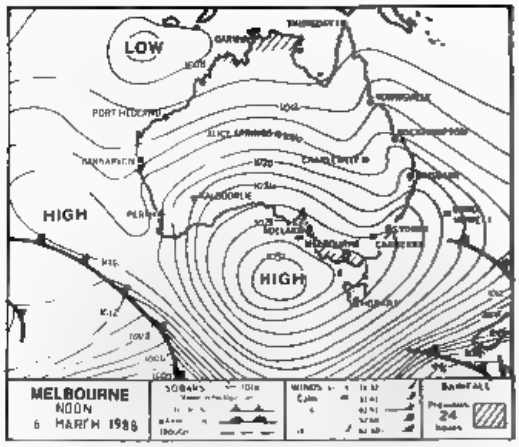
Sorry folks, the previous paragraphs have been superseded by Les, before they had time to be written to the computer's disc. Les VK3ZBJ, 'pedalled harder' and placed another signal into the shack of Dave VK6AOM, in Esperance, at 2256 on March 22. Dave didn't believe his ears, but there was Les, loud and clear, and he had the pleasure of receiving a 5 x 7 report on 1296 FM.

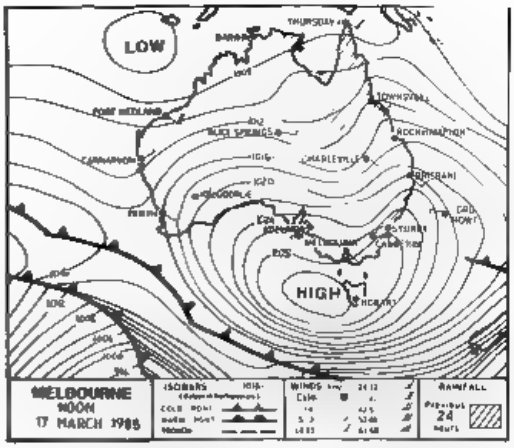
Les, was using his home-brew 55 watts output, into a two metre dish located 122 metres above sea level, combined with a MGF1402 Front End.

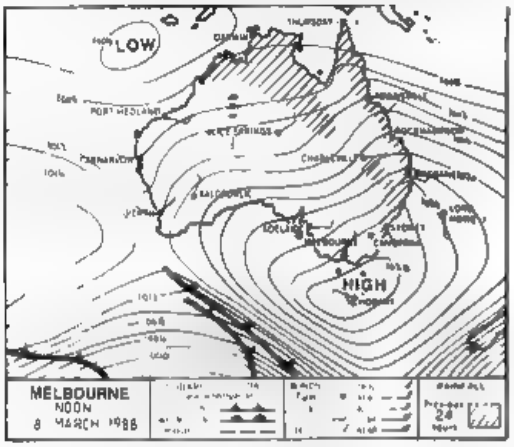
Please, NO more records this week, folks, as there is no more room left, to write updates in as the magazines come off the printing press.

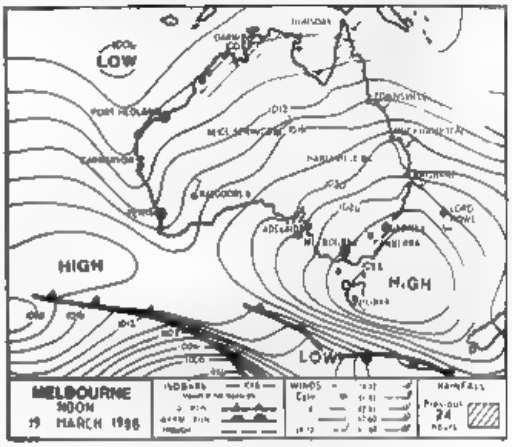
-Contributed by Ken VK3AH, with the assistance of many other dedicated VHF/UHF enthusiasts.

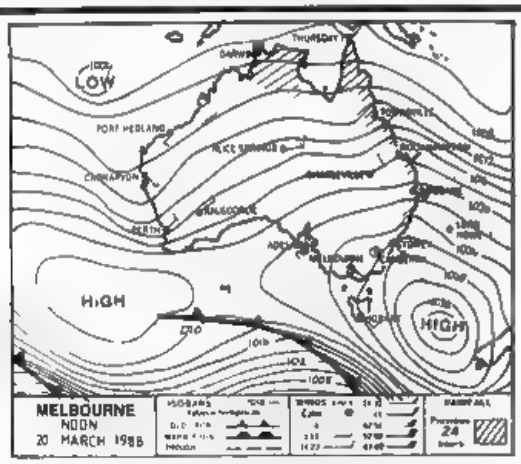
CONGRATULATIONS TO ALL PARTICIPANTS

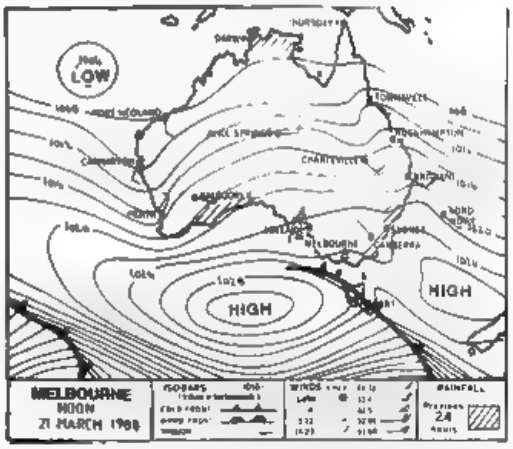


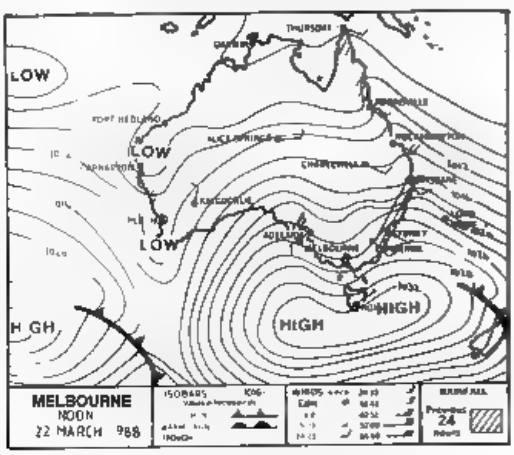


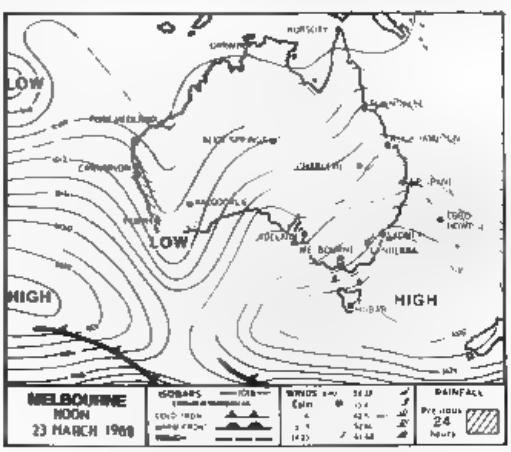












Meteorological maps courtesy of the Commonwealth Bureau of Meteorology

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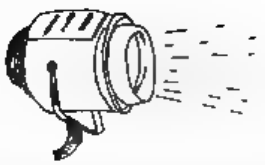
	FORD ELECTRONICS UNIT 19 70 ROBERTS STREET OSBORNE PARK (09) 242 1766



Spotlight on SWLing

Robin Harwood VK7RH
5 Helen Street, Launceston, Tas. 7250

Well, it is Winter and I am spending most of my daylight hours listening across the bands. You will have noticed that signals are coming in from Europe and the Americas during the daylight hours. Many signals beamed to the Americas during their night-time hours are steadily coming in, particularly on the 25 and 31 metre broadcasting allocations. Also there is the propagational path via Antarctica on the 49 metre allocation from Central Europe and the British Isles around 0200 UTC.

Do not forget either that the J-88 period commences on May 1 from 0100 UTC. The previous period was hectic catching up with all the changes caused by seasonal alterations to frequencies. As well, Central Europe and the UK, plus the USSR, went onto Daylight Saving Time. This meant that broadcasts targeted to European audiences are aired according to the local time rather than UTC, which meant programming was one hour earlier. Another target area which has a similar format is the Peoples' Republic of China which went on Summertime early last month.

Another reason why I am pleased to be back enjoying the hobby is that I have stepped down from Divisional Council after a two year stint. Now, I can readily appreciate all the hard work done behind the scenes by the backroom lads and ladies. Yet there was another organisation who wanted me to rejoin their committee, after learning about my "free time" but tactfully I declined.

One resolution I made at the beginning of this Bicentennial Year was to start and despatch reports on observations once again to International broadcasters. Already one report has been sent to the World Service of the Christian Science Monitor (Radio WCSN) in Boston and I hope to be able to send other reports regularly. Although the technical staff are appreciative of signal reports, often it is the program-makers who are very interested in comments about the format and content of the station. So, as a tip to those contemplating sending reports in, I strongly recommend you attach your comments and reactions to their programming.

Several international broadcasters, particularly those dependent on state funding of their operations, have been facing budgetary cutbacks. Some of those likely to be affected are our own *Radio Australia*, the giant *Voice of America* network in Washington and *Radio Canada International* in Montreal. The VOA recently told its Congressional watchdog that it was cutting back on total broadcast hours per day and dropping two language services this year. In 1987, they dropped Korean and closed the USIA offices in Korea. Yet they are going ahead with their expansion plans to upgrade their relay bases world-wide. The first one targeted for upgrading is the Sri Lanka relay from Colombo. Their base is in the south of the island nation, unlike the Deutsche Welle relay at Trincomallee in the troubled north, which has been closed for some time now. The island's Civil War also forced *Radio France International* to drop the idea of also using Sri Lanka as a relay base.

Whilst on relays bases, *Radio Exterior Espana* in Madrid, has been using facilities of Radio Beijing's Kunmig site in the PRC to broadcast to Japan and the Philippines in Spanish. The former comes in well here on 7.165 MHz from 1000 to 1055 UTC and also its second harmonic on 14.330 MHz was heard weekly and reported on to the Intruder Watch. Radio Beijing also utilises the Canary Island relay of REE at 0500 UTC to North America in English on the 31 metre band. Meanwhile REE reportedly are going to set up a relay base in Costa Rica by the 1990s and jointly share it with Costa Rica, which does not yet possess an international service, although some commercial stations come in very well on the 49 metre band.

Later this year or by this time next year the BBC hopes to start using the Seychelles Relay to East Africa. They have also been recently upgrading the antennas on their Ascension Island relay in the Atlantic. Deutsche Welle have commenced to use the relay facilities of Radio Veritas in Manila for their Chinese language broadcasts at 1300 UTC. It is not, however, a direct relay as the program is recorded earlier and taken by road to the transmitting site and so is out of synchronisation with the DW signals coming direct from Germany. DW also had an experimental service in Portuguese from Radio BRAS in Brazil, although I am at present unaware if this is going to be a permanent arrangement.

I had expected to be in a position to review both the *World Radio TV Handbook* and the *International Broadcasting Handbook* this month. However, I have not seen any copies yet. Perhaps later in the year! Incidentally, in one of the club newsletters I saw that I was expected to write an article on one prominent South Australian SWL without possessing any background material. If the office bearers in the organisation concerned contact me I will see what I can do in the future.

Well, that is all for this month and good listening!
73 de VK7RH

ar

Education Notes

Brenda Edmonds VK3KT
FEDERAL EDUCATION OFFICER
56 Baden Powell Drive, Frankston, Vic. 3199

I have appealed previously for information about individuals or groups who are committing their time to helping newcomers to gain or upgrade licences, so have been pleased to receive word about some CW nets. In addition to the traditional Slow Morse Broadcasts from VK2BWI, and VK5AWI, on 3.550 MHz at 0930 UTC each evening, I have the following information:

Early Birds Net, 10 WPM, DOC type and 5 Character Groups	0700-0815 EST Mon-Sat	3.547 MHz	VK3DEG, VK3EDS, VK3AHU, VK3CLV
Early Birds Evening Net, 10 WPM, DOC type, and groups	1815-1900 EST Mon-Fri	3.539 MHz	VK3DEG, VK3DZZ
15 WPM	1900-2000 EST Mon-Fri	3.539 MHz	VK3COP, VK3CJT
10 WPM	2030-2130 EST Mon-Fri	3.540 MHz	VK3FO

In addition, in VK3 we have VK3RCW on 144.950 MHz broadcasting five and 10 words per minute alternately most of the day.

I would be pleased to hear of other nets or facilities in other States so that I can build up a set of information for publication in occasionally in AR.

The dedication and interest shown by those who run these services is a valuable contribution to the training side of our organisation.

Statistics from the November examinations was received recently. The trend towards higher pass rates has continued, with overall figures of:
51 percent for AOCP Theory, range 46 percent VK3 to 62 percent VKs 6 and 7 (VK1, 4/6 candidates).
60 percent pass for NAOCP Theory, range 44 percent VK5 to 67 percent VK2.
71 percent pass for Regulations, range 43 percent VK1 to 81 percent VK7.

Figures for States with few candidates are hardly statistically significant, but the indications are that more candidates are succeeding.

Several tentative conclusions are possible:
a) The examination standard is dropping, ie examinations are getting easier.
b) The calibre of the candidates is rising.
c) The class teachers are doing a better job.
d) The questions are becoming known.
e) The recent rise in examinations fees has reduced the number of "have a go" candidates.
f) There is some completely different explanation.

A figure that does seem to be significant is the drop in the number of candidates applying and then not sitting the examination. Presumably the cost factor is responsible here.

The availability of the examination statistics from the Department does allow some measure of checking on the standard of the papers.

One aspect of the devolvement proposals that worries me is that no provision seems to have been made for the collection of this type of information, or overall review of the system as time goes by!

With a number of examiners running exam nations for small groups at frequent intervals, the possibility of any statistical analysis is remote. No procedures have been suggested which require examiners to supply a central authority with the pass rates.

If, as the Department insists, quality control measures are to be instituted, it would seem to be logical to require information about all candidates, not just those who pass.

This may be an area where the Institute has to maintain a watching brief, to collect and collate information and to carry out some analyses, but if so it will have to be as a result of a Department directive, not on a voluntary basis.

Some groups, clubs, or Divisions will want to keep and analyse their own records, but to be sure the system is working smoothly and is fair to all it seems to me that machinery must be established right at the start to collect all possible information so that it can be retrieved as required, and to establish procedures for reviewing the system at regular intervals.

73 Brenda VK3KT

ar

Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Are you new to amateur radio? If so, welcome to the hobby. I am sure you will have many years of interest ahead. But whether you are new to the hobby, or have been involved for some time, you may be curious as to some of the weird sounds that are to be heard on the air. If you are, in fact, curious and care to send me a blank C60 cassette tape, I will return it to you with all the major modes of emission on it, with explanations of what they are, and mode designations. This tape will enable you to identify all the various modes you are likely to hear as you wander around the bands. Send the tape to me at the address shown at the top of the column.

Reports were received in January from the following:
VK2s DEJ, EYI, MUZ, PS, D Pearce (VK3 SWL), VK4s AKX, BHJ, BTW, BXC, DA, KHZ. VK5s GZ, TL, VK6RO, VK7RH, VK8s HA and JF.

There were 126 AM intruders reported, 217 using CW, 212 using RTTY, 129 using other modes and 34 intruders identified on-air.

Some good news... a report from JM1UXU, the Secretary of IARU Region 3, informs us that Radio Beijing (Peking) has vacated the 40 metre amateur band as from September 25, 1987. This means that the Chinese broadcast station, which has been plaguing us for years, will no longer be a problem.

This is a result of years of concerted effort by various intruder watches, monitoring systems, member societies, the administrations involved, and many groups and individuals. Undoubtedly, final work was carried out between the JARL and CRSA (China). There are still other broadcast stations operating between 7.0 and 7.1 MHz, but now there is one less, which is a plus for amateurs world-wide. Congratulations to all concerned.

Finalising the *Mode for the Month* series, we turn our attention to the 30, 17, and 12 metre bands (WARC bands).

During the series, I made no reference to these bands with regard to the presence of intruders. This is because these bands, which are relatively new allocations to the amateur service, and have yet to be allocated to many countries, are not exclusive to the amateur service. At the moment they are all shared bands. In short, I feel that intruder activity on these bands is not worthy of our attention just yet, until the bands are declared amateur-exclusive. Many of the so-called intruders appearing on these bands cannot really be classified as intruders under the present band-sharing arrangements.

Let us know what you hear on the other bands, and we will turn our attention to the WARC bands when conditions dictate. See you next month, and take care. 73 for now.

mr

How's DX?

EUROPEAN DX NET

The European DX Net meets each Saturday on 14.243 MHz, from 0630 UTC. Net Control Station is OE6EEG, a very pleasant and efficient operator.

On March 5, 1988, I worked TA2L, Turkey, SV5ADM Dodecanese and S0RASD, Rio de Oro in NW Africa.

Contributed by George Cranby VK3GI

CHINESE DXPEDITION

The Chinese Radio Sports Association and the Chinese Mountaineering Association will be setting up two special amateur radio stations, BT0LS, located in Lhasa, Tibet, and BT0ZML, located in the base camp on Mount Zhumulangma (Mount Everest).

The stations are part of the China, Japan, Nepal Friendship expedition to Jolmolungma 1988, and will operate during March, April and May 1988.

They plan to work CW and SSB on the 15, 20 and 40 metre bands.

Both stations are QSL via PO Box 6106, Beijing, China.

Contributed by Zhou Yu-Hong BY4AA

WORKED ON THE EAST COAST — from February 6 to March 9, 1988

3.5 MHz: Doug VX5RAX/6 in Canada using a special call sign prefix. At 1430 UTC using CW. (There were many stations on the band at this time in the USA).

7 MHz: Jose EA4BJN, on CW at 0742 UTC. (Several USA contacts were also made).

14 MHz. Many contacts, see following:

Rudi VK9LF Rud DJ5CQ, is again in Australia. QSL to his home QTH.

Louiz PY4AH, from the Matto Grosso area of Brazil at 0422 UTC.

ZS4TX at 0749 UTC.

FO5JV. QSL direct to PO Box 380, Papetee, French Polynesia.

Dave KC4USV, at McMurdo Antarctic Base.

Peter OA4ZP, at 1217 UTC. In Lima. Peter is of Swiss origin and has lived in Peru for the past 21 years.

Art 9H4R, from the Island of Gozo. Operating CW at 0626 UTC.

Henry IS0QDU, from Sardinia Island at 0178 UTC.

Dimitri SV5ADM, on 14.243 MHz at 0631 UTC. QSL direct to Dimitri, PO Box 464, Rhodos Island, Greece.

Michel TU2QQ, on the Ivory Coast. QSL direct to F6FNU.

Laurent FJ5BL, on Saint Bartholomeo Island in the Caribbean. The contact was extracted from a large "dog-pile" at 0554 UTC. QSL to F6AJA.

Roger ZK1XD. This was DL5RBW on holidays in Raratonga. QSL to his home call.

Jacek JW0B, at 1130 UTC. Jacek is a member of the Polish Arctic Expedition. QSL to SP5EVN.

21 MHz

Ron ZL9BQD, operating from Auckland Island. QSL to ZL1BQD.

Bus W200OEK, operating CW from Oregon using a special call sign commemorating 200 years of the USA Constitution. QSL via W7VSE.

Karl 3D2VU, operating CW in Lautoka. QSL to DB5UJ.

Alfo HC5AI/3, operating CW in Santa Rosa, Equador.

The AX-prefix was used extensively with good results... and this gave me the opportunity to explain about our Bicentenary Celebrations and draw attention to the various VI88 special event stations.

Alex 4K1LPK, in the "Russkaya" Russian Antarctic Base was heard on 14 MHz SSB but not worked. QSL to UY5OO.

ZD8HH, was also heard in a "dog-pile" from Ascension Island, on 14 MHz SSB.

Those interested in rare European countries and African stations should tune to Selim's Net on 14.243 MHz every Saturday around 0630 UTC. Selim is OE6EEG and "booms" into Australia long path at this time.
(See also note above from George VK3GI).

Good DX, Steve.

Contributed by Steve Pall VK2PS

mr

QSP

PHONE PATCH PROGRESS REPORT

About 25 Line Isolation Units (LIU) for phone-patching, as published in AR magazine, September 1987, page 33, have now been authorised for connection to the Telecom telephone network.

Geoff Donnelly VK2EGD, said a problem faced by some submitting LIUs had been their inadequate packaging resulting in switches being damaged during transit.

Two units submitted also had isolation transformers other than those specified in the AR article — Arlec 45035 or Ferguson MT627 — note also the follow-up correction in AR magazine November 1987, page 40.

Geoff said it was important that only specified components be used which were readily available.

He said only one LIU had been rejected — due to a faulty component and the need for wiring and construction improvements. But, its constructor had been given advice on having a second attempt and should have little problem in getting a LIU up and running.

"The rest have been good or excellent examples of the home-brewing skills of radio amateurs. About half of them are excellent and better built than the prototype submitted by the WIA for Telecom approval," Geoff said.

Printed circuit boards are available from RCS Radio Pty Ltd at Bexley, NSW. When ordering the PCB please quote part number 12240.

LIUs should be sent for authorisation to the WIA NSW Division, Parramatta, complete with the sender's name, and the telephone number intended to be used for phone-patching. This information is needed before approval can be granted.

General inquiries about LIUs can be directed to Geoff Donnelly VK2EGD, QTHR.

NEW DX COUNTRY

Aruba P4, is now a separate country recognised by the ARRL for its DXCC. Credit for Aruba, now separate from the Netherland Antiles, will be given for contacts made after January 1, 1986.

Contests

Frank Beech VK7BC
FEDERAL CONTEST MANAGER
37 Nobelius Drive, Legana, Tas. 7251

CONTEST CALENDAR

MAY 1988
14 — 15 CQ M Contest (Rules April issue)
21 — 22 World Telecommunications Day Contest (Rules this issue)
28 — 29 CQ WW WPX CW Contest

JUNE 1988
18 — 19 All Asian Phone Contest
25 — 26 VK Novice Contest (Rules this issue)

JULY 1988
16 — 17 CQ magazine WW WPX VHF Contest

AUGUST 1988
13 — 14 VK Remembrance Day Contest (Rules next issue)
27 — 28 All Asian CW Contest

50th COMMONWEALTH CONTEST RESULTS — 1987

Congratulations to VK6LW for being the top Australian entrant with a score of 4648. VK2APK was second with 4055 and VK4XA was third with 3703.

The full results in the transmitting section for 1987 were published in November 1987 AR

You will have noticed from the results of the last Ross Hull Contest in last month's AR that the winner was the station that managed to work the most DX (or distance), this was an intended feature of the rules as was the scoring of one point per contact. The aim is to work as many locator squares as possible, and to do this a station has to work harder, as the number of squares worked increases.

I have received a letter from the international section manager of the JARL indicating a plan which will be submitted to the next Region 3 regional conference and refers to a contest segments plan which will be accepted world-wide. This would be a worthwhile endeavour and could assist in the reduction of some of the more objectionable behaviour that occurs during the heat of contests.

VK NOVICE CONTEST 1988 — Rules

Contest Period — From 0800 UTC, June 25 1988 to 0759 UTC, June 26 1988

Object of the Contest — To encourage contest operation of amateur radio stations in Australia, New Zealand and Papua New Guinea, with special emphasis on contacts with Novice and radio club stations.

Stations Eligible — Only stations in VK, ZL and P2 call areas may enter. No stations outside these areas are permitted to be worked or entered in a log for the purposes of this contest. Except for radio club stations, no multi-operator working is allowed. Stations in the same call area may contact each other as well as contacting stations in other call areas.

Contest Bands — All operations must be confined to within the Novice frequency sub-band allocations in the 10, 15 and 80 metre bands. No cross-band operation is permitted.

Modes of Operation — Only Phone or CW may be used. In the CW mode, operation must not exceed a speed of 15 words per minute. This is to encourage the use of CW by all operators and to allow improvement in this mode by those operators who do not usually practice same.

Contest Sections —
Section a) Phone — Novice/Full Call
Section b) CW — Novice/Full Call
Section c) Listeners.

Scoring —
Transmitting — for contacts with a Novice Station — five points
for contacts with a Club Station — 10 points
for contacts with a Full Call station — two points.
Listener Entrants — for Novice to Novice Contact — five points
for Novice to Full Call Contacts — two points
for Full Call to Full Call Contacts — two points
for any contact with a Club Station — 10 points.

Call Procedure — For phone operation call *CQ Novice Contest* and for CW operation call *CQ N*.

Contacts — Any station may be contacted only once per band.

Number Exchange Section A — On phone, stations must exchange a serial number comprising an RS report followed by three figures. The figures must commence with 001 and increase sequentially by 'one' for each contact up to 999. If 999 is reached the serial number will revert back to 001.

Number Exchange Section A — For CW, stations must exchange a serial number comprising an RST report followed by three figures on the same basis as described above for a phone contact serial number.
Radio club stations must add the letter 'C' following the serial number.

Log Entries — Each log sheet should be laid out such as to provide columns in the order given as follows.
Date/UTC Time, Band, Mode, Station Contacted, Serial Number Sent, Serial Number Received, Claimed Score.
Each log sheet must also be endorsed at the top VK Novice Contest 1988.
Total Claimed Score for each page must be shown at the bottom.

Front Sheet — A front sheet must be attached to each log entered and must carry the following information:
Name of Operator, Address, Call Sign, Section Entered, Claimed Score.

Declaration — The Front Sheet must also carry a declaration which states —

I hereby certify that I have operated within the rules and spirit of the contest. Each entry must carry the signature of the licensed operator of the station and be dated accordingly. In the case of a club station the entry must be signed by a responsible officer of the club committee or a licenced operator delegated by the committee to do so. In the case of multi-operator stations, the call signs of participating operators must also be shown on the front sheet.

Regulation — All stations participating in the contest must be operated within the terms of the station licence and applicable regulations.

Entries to — Logs are to be forwarded to the Federal Contest Manager, entries must be posted so as to reach the Contest Manager no later than July 29, 1988. The address for entries is: Federal Contest Manager, Frank Beech VK7BC, 37 Nobelius Drive, Legana, Tas. 7277.
Envelopes are to be endorsed Novice Contest.

Certificates — Certificates will be awarded to the top scoring entries in each section at the discretion of the Federal Contest Manager and to any other entrant where meritorious operation has been carried out in the opinion of the Contest Manager.

Trophy — The *Keith Howard VK2AKX Trophy* will be awarded to the Novice entry with the highest aggregate score from both the Phone and CW Sections of the contest. This trophy is a perpetual trophy and will be held by the winner until such time as it is awarded to a winner of a subsequent Novice Contest. Should two or more aggregate scores be equal, a decision will be based on a count back as to the greater number of Novice stations listed in each log entry. Should such a count also be equal, the log containing the greatest number of CW contacts will be preferred. In the event of a further tie, under these rules the log will be placed before a committee which will exercise a vote as to the neatest and most meritorious entry.

Disqualification — The Contest Disqualification Criteria, as published in each August issue of *Amateur Radio* shall apply. Any station observed during the contest as constantly departing from the generally accepted code of operating ethics, may also be disqualified.

Operator — A person may only submit one contest log per mode. Logs for entries where an operator uses more than one call sign whilst operating in this contest will not be accepted.

WORLD TELECOMMUNICATIONS DAY CONTEST — 1988

Amateurs throughout the world are invited to participate in this world-wide activity sponsored by the IARU in celebration of *World Telecommunications Day (May 17)*.

Contest Period — (Third full weekend in May)
Phone and CW — May 21-22.
Starts — 0000 UTC Saturday. Ends — 2400 UTC Sunday.

NOTE — Phone and CW are separate contests.

Objective — The object of the contest is for amateurs around the world to contact other amateurs in as many different ITU Zones as possible.

Bands — Only the 160, 80, 40, 20, 15 and 10 metre bands may be used.

Categories —
a) Single Operator/Single Transmitter/All Band operation only. (Single operator stations are those at which one person performs all of the operating, logging and spotting functions. The use of multiplier spotting nets or any other form of alerting assistance is not allowed in this category).
b) Multi-operator/Single Transmitter/All Band operation only. (After a band change the station must remain there for at least 10 minutes following the initial of the subsequent transmission on that band).

Contest Call and Number Exchange — "CQ WTD Contest" or "Test WTD". RS/T report plus ITU Zone (ie 5913 on phone or 59913 on CW).

Points —
— Contacts between stations on different continents are worth two points on the 10, 15 and 20 metre bands and four points on the 40, 80 and 160 metre bands.
— Contacts between stations on the same continent but different countries are worth one point on the 10, 15 and 20 metre bands and two points on the 40, 80 and 160 metre bands.
— Contacts between stations in the same country are permitted for zone multiplier credit but have zero point value.

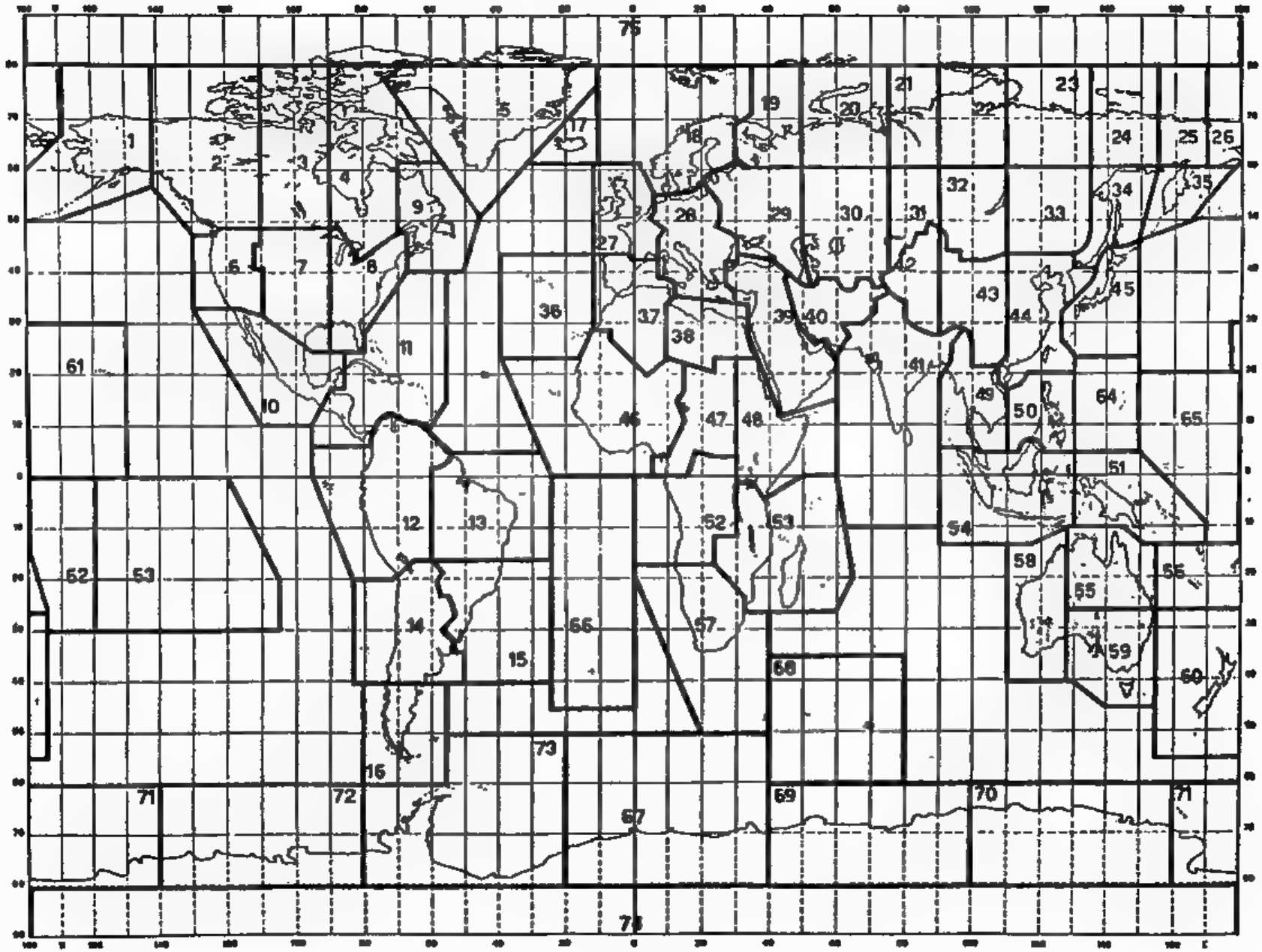
NOTE: In each contest the same station may be worked once on each band. The WAC continental boundaries and the DXCC country list are the standards.

Multipliers — On each band, the multipliers are the 75 geographical zones for broadcasting established by the International Telecommunications Union (ITU).

Scoring — The final score is the result of the total QSO points multiplied by the sum of all multipliers worked on each band.

Awards —
— Plaques will be awarded to the first place scorer in each of the operator categories listed under Categories.
— Certificates will be awarded to the first place scorers in every participating country.

NOTE: Depending on the number of entrants from



ZONES GÉOGRAPHIQUES POUR LA RADIODIFFUSION

GEOGRAPHICAL ZONES FOR BROADCASTING

ZONAS GEOGRÁFICAS PARA LA RADIODIFUSIÓN

each country, second and third place certificates will be considered by the Contest Committee. All plaques and certificates will be issued to the licensee of the stations used.

Log Instructions — All times must be in UTC. All sent and received exchanges are to be logged. Use a separate log sheet for each band. Indicate zone multiplier only the first time it is worked on each band. Logs must be checked for duplicate contacts, correct QSO points and multipliers. Each entry must be accompanied by a Summary Sheet showing all scoring information, the category of competition, contestant's name and address in block letters and a signed declaration that all contest rules and regulations for amateurs radio in the country of operation have been observed.

Disqualification — Violation of amateur radio regulations in the country of the contestant, or the rules of the contest, unsportsmanlike conduct' taking credit for excessive duplicate contacts; unverifiable QSOs or unverifiable multipliers will be deemed sufficient cause for disqualification. Actions and decisions of the Contest Committee are official and final.

Deadline — All entries must be postmarked no later than July 31, 1988. Logs to posted to: LABRE, WTD Contest Committee, PO Box 07-0004, 70000 — Brasilia (DF), Brazil, South America.

SANGSTER SHIELD CONTEST

Presented to the amateurs of New Zealand by Mr R Sangster in 1927 the Sangster Shield is for annual competition to be won by the most efficient station. In this respect it should be pointed out that, in addition to the efficiency of the transmitter itself, the efficiency of the operator is of the utmost importance. To win this contest marks an operator as one who not only knows how to obtain the most output from low power but also as one who is most proficient in the art of telegraphic communication.

1 WHEN? May 7-8, between the hours of 8 pm and midnight on each day. The maximum period of operation will be eight hours.
2 POWER: To compete for the Sangster Shield the output of the transmitter must not exceed five watts.
3 CW to CW contacts only are permitted.
4 All operation must be in the 80 metre band.
5 a) Contacts with any one station permitted on each hour, based on 'even hour'' basis — eg 2000 to 2100; 2100 etc, etc.
b) It is not permissible to QSO the same station "twice running" eg at the end of one hourly period and at the beginning of the next. A different station must be contacted before the "same" station is contacted again.
c) Except that this is permissible when one of the two stations concerned has contacted a different station between QSOs or when there is a time delay of at least five minutes between contacts.
6 All ZL entrants must be financial members of NZART.
7 All radio regulations must be observed.
8 In the event of any dispute, the ruling of the Executive Council will be final.
9 Logs:
a) Quarto or A4 size paper — preferably NZART log sheets.
b) Date in this order: date, time, call of station contacted, serial sent, serial received, points claimed.
c) On a Separate Sheet a summary to show:
i. Call sign, name and address in BLOCK LETTERS.
ii. Number of contacts with stations using five watts or less.
iii. Number of contacts with stations using six watts of more.
iv. Number of contacts with overseas stations using five watts or less.
v. Number of contacts with overseas stations using six watts or more.
vi. List of different Branches worked with number and name of the Branch in order as given in the *Call Book*, together with the call sign of the station claimed as a multiplier for that branch.
vii. Total Score — (total points and different branches).
viii. Description of equipment used and power used.
ix. Declaration that all contest rules have been observed.
d) Underline each new Branch claimed as a multiplier. (Underline all entries for that QSO)
10 Cipher System:
a) RST followed by Branch number followed by power output, eg 569/11/04. This would indicate a 569 report; Branch 11; and Power of four watts. Power will always be given as two figures — over 100 watts will be given as 99 whilst below 10 watts will be preceded by 0.
b) Overseas stations give RST plus power but must receive the full cipher from the ZL station.
11 Scoring:
a) Overseas contacts with power given as five watts or less — 20 points.
b) Overseas contacts with power given as six watts or more — 10 points.
c) ZL contacts with power given as five watts or less — five points.
d) ZL contacts with power given as over five watts — one points.
e) Overseas stations using five watts or less may claim a bonus of five points per contact.
FINAL SCORE is the total of points multiplied by number of different NZART Branches contacted.
NOTE: Contacts with a contestant's OWN Branch are okay for QSO points but NOT as a multiplier.
12 Mobile or Mobile/Portable operation is not permitted. The station must be operated from a fixed location for the duration of the contest.
13 Awards:
a) The Sangster Shield to the highest scorer using five watts output or less.
b) The Transistor Trophy to the highest scorer observing the rules as enumerated, but in addition who has been licensed for 12 months or less. Entrants must give Operator's Certificate number together with date of issue.
c) Certificates to the first three contestants using five watts or less, similarly to "newly licensed" entrants.
d) A certificate to the contestant using over five watts with the highest score made from QSOs with stations using five watts or less.
e) Certificates to Overseas stations to the highest scorer in any call area.
14 Logs must be posted to reach the Contest Manager, Alan Hughes ZL3KR, 4 Exton Street, Christchurch 5, New Zealand, on or before June 2 1988.
15 To give QRP Contestants a fair chance (particularly with DX stations) higher power stations are requested to operate above 3.530 MHz.

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REPEATERS & BEACONS

Tim Mills VK2ZTM
FTAC Beacon Co-ordinator

Elsewhere in this issue of *Amateur Radio* is a proposed band plan for 10 GHz. Whilst there are perhaps only a few amateurs active in this region, it requires interest and input from everyone. Acknowledgment from both individuals and interest groups should be sent to The Federal Technical Advisory Committee (FTAC), WIA Federal Office, PO Box 300, Caulfield South, Vic. 3162.

Recent correspondence from New Zealand indicated a possible change in their two metre beacon segment from above 145 MHz, where the frequency indicates the region, eg 145.100 MHz is in ZL1 to the segment 144.300 to 144.400 MHz. This is just below the Australian beacons. It would mean that the segment is at the top of what we consider is the narrow and tunable portion of two metres. Is there currently much operation in 144.300 to 144.400 MHz which would be affected? Please communicate direct with FTAC if you have a comment or other input.

Sydney beacons, VK2RSY, have had a prefix change for this year. QSL cards will be exchanged via the bureau for reports received on the ZX2RSY transmissions. Note that the 10 metre transmission has a little extra so have a look for it on 28.262 MHz.

What value is a beacon? VK2RGB at Gunnedah, on 52.425 MHz has been operational for many years. The very small group has to maintain both a beacon and a repeater which eats into the budget. Would it be missed if it was taken from those who benefit by its existence. Drop a note to the State Repeater Committee, PO Box 1066, Parramatta, NSW. 2150.

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Book Review

Better Radio/TV Reception

Authors: A Nallawalla; A T Cushen; B D Clark

Published by Ashley Publishing

Reviewed by Gil Sones VK3AUI
20 Moore Street, Box Hill South, Vic. 3128

Listening to DX Radio and receiving DX Television is a hobby which is closely allied to amateur radio. Indeed, at one time, most of the new recruits to the amateur ranks came by this route. Nowadays many still do but listening is a separate hobby which offers considerable interest to many.

This book offers a broad coverage of the hobby and provides a great deal of useful information on many of its aspects. There are both technical topics which are written so as to be understandable by a wider section of the community with less technical expertise than many amateurs and topics on the more general aspects of the hobby.

How to send a listener report is something which is of some importance to the beginner. Even those with an amateur licence would find the requirements of reporting on Broadcasting to be of great value. It is rather different to the amateur practice of sending off a card. The information of use to a broadcaster is rather different. All this is explained in this book.

Receivers are covered in some detail along with explanations of desirable features. This is of considerable value as many suitable receivers have a quite bewildering array of features. Also covered are the advantages and disadvantages of duty free purchases. Very worthwhile as one can often forget the problems in ones rush to get a bargain.

Aerials and propegation are covered in a manner which can be easily understood.

The book is a very worthwhile purchase for anyone engaged in the hobby of DX Listening.

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NOVICE STUDY GUIDE

Reviewed by Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3132

A problem facing both those studying and teaching the theory for the Novice theory examination from the DOTC syllabus is just how deep the theory on a particular topic should be covered.

Lecturers have had the unenviable task of teaching theory at the right level and not above that needed by candidates for the Novice examin-

Those studying from text books also have, until now, been unsure how much to read on a theory topic sufficient to pass the examination.

With the *Study Guide for Novice Amateur Operator's Certificate of Proficiency* produced by the WIA Federal Education Committee, there is now a useful document to indicate the depth of theory on each syllabus topic.

The guide will also help those wanting to write Novice theory questions for examinations under the DOTC examination devolvement plan.

It is available from the WIA for $2.50 postage extra. Much voluntary labour by a group involved in teaching theory classes went into the Study Guide over an extended period of time.

WIA Federal Education Officer, Brenda Edmunds VK3KT, said she would welcome any comments on the Study Guide.

The theory syllabus for both the Novice and AOCP examinations were revised in 1984, and the Study Guide reflects the changes to the Novice syllabus.

Work has begun on a Study Guide for the AOCP theory. Brenda said she would particularly like to hear from those who conduct AOCP theory classes on their thoughts about the depth of theory topics on the AOCP examination.

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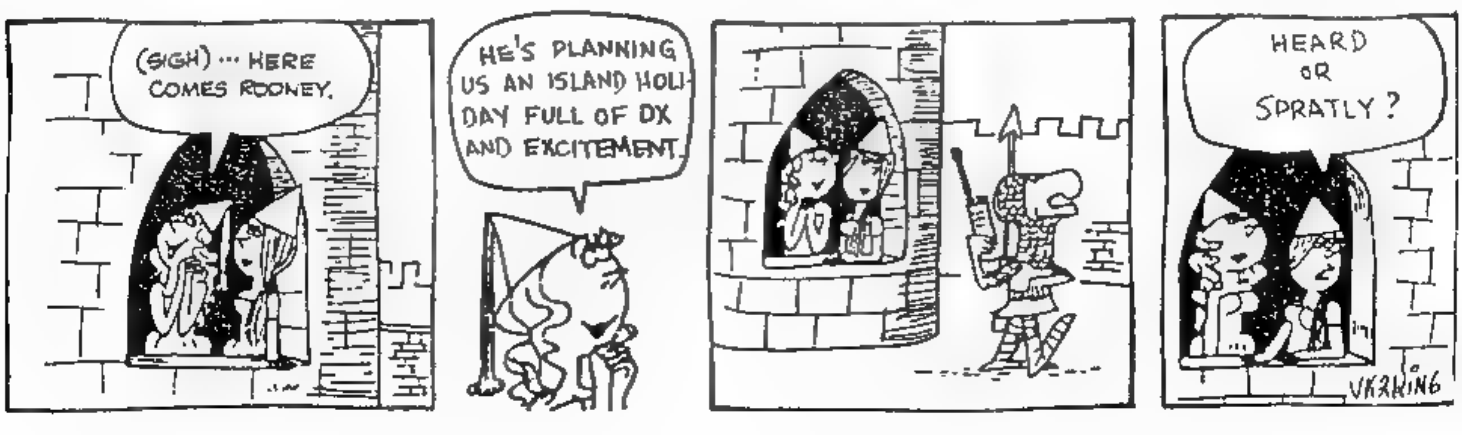


Cartoon courtesy the *Propagator*

Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Alberton, SA 5014

AWARDS ISSUED IN JANUARY AND FEBRUARY 1988

DXCC PHONE

362	Peter Sykes VK7YP
363	Staunton McNamara VK5ZH

WAVKCA

1563	William J Mathews VK3WJ
1564	Serge A Sinitsin UJ8JX
1565	Alex Kovach RB5DX
1566	Alex M Kuznetsou UY5EG
1567	Yuri Sarichev UH8EAD
1568	Gennady Kolmakov UA9MA
1569	Valentin Kudryavtsev UA4LM
1570	Valery V Saldin RA4HA
1571	Temirtau Club Station RL8PYL
1572	Stasys Kazelis UP2BAR
1573	Natan Sterental OA4OS
1574	Isao Numaguchi JH1ROJ
1575	Ted L Pounders KI4M

DXCC UPDATES

VK3OT	301/305 ph	304/306 op	
VK5BO	221/222 ph	[illegible]	
VK6YF	213 ph		
VK3AKK	311/315 ph	209/210 CW	311/315 op
VK4KS	317/348 ph	317/356 op	
VK4RF	314/327 ph	297/321 CW	314/344 op
VK6BQN	186/190 ph		

KARL AWARDS PROGRAM

The following Korean Amateur Radio League (KARL) awards are available to all licensed radio amateurs and SWLs.

HLA (HL Award): Will be issued to all amateurs and SWLs who receive QSL cards from any HL stations (except HL9), depending on the number of contacts made/heard with/from HL stations (except HL9), one or more of the following classes may be claimed.

Class K — five QSLs required
Class O — 10 QSLs required
Class R — 20 QSLs required
Class E — 30 QSLs required
Class A — 50 QSLs required

Stickers for affixing to certificates endorsing additional credits are available in multiples of 50 upon submission of QSL cards.

AKA (All Korea Award): Will be issued to amateurs and SWLs who received QSL cards from HL stations. At least one from each of seven different call areas, ie 1, 2, 3, 4, 5, 8, and 0.

KDN (Korean District Number Award): Will be issued to amateurs and SWLs who receive at least one QSL card from HL stations located in each of the different cities, Guns or Gus in Korea.

This award will be issued in multiples of 50, (KDN 50, 100, 150) upon submission of cards with a list prepared in order of KDN reference numbers.

APA (All Province Award): Will be awarded to amateurs and SWLs who receive QSL cards from HL stations located in each of different special cities and provinces in Korea.

Area codes for each City and/or Provinces are as listed below:

AREA [illegible]	PROVINCE and/or CITY
1	City of Seoul
[illegible]	Inchon City, Kyonggi-do, Kangwon-do
3	Chungchongnam-do, Chungchongbuk-do
4	Cholla nam-do, Chollabuk-do, Cheju-do
5	Pusan City, Taegu City, Kyongsangnam-do, Kyongsangbuk-do

GENERAL RULES AND REQUIREMENTS

Eight IRCs will be charged per award and four IRCs for each HLA sticker.

If QSL cards are submitted, they must contain enough IRCs for return postage.

Endorsements for such operating distinctions as bands, modes and QRP may be applied for.

Proof of contacts/reception made with any HL station (except HL9) on/or after February 3, 1959, will be acceptable.

Proof of contacts/reception made with any US Army stations in Korea (HL9 call area) will not be acceptable.

All contacts must be made within the same call area.

KARL, as the Amateur Radio League of the country hosting the 24th Seoul Olympic Games, plans to make a Commemorative Award available to all amateurs/SWLs. The award is issued in [illegible]

Class A: Establish contact with one special event station (prefix 6K) and at least one from each of five different call areas, ie HL1-HL5.

Class B: Establish contact with HL stations and compose "SEOUL" with the last letter of call signs including one QSO with the Olympic Special Event Station (prefix 6K) or any HL stations with the call number 88.

Class C: Compose the words "SEOUL OLYMPICS" with the last letter of call signs from any five or more DXCC countries including at least one QSO with an HL station.

HOW TO APPLY:

GCR plus 10 IRCs or US$5 and one of your own QSL cards will be charged for the award.

Proof of contacts/reception made on/or from January 1 to October 5, 1988 will be accepted.

Endorsements for specific bands, modes and other pertinent data may be applied for.

The application will be accepted during the period October 1, 1988 to October 5 1989.

Special even stations and other commemorating stations described in the above are as follows, and will be operating for 35 days covering the period from September 1, 1988 to October 5, 1988.

CALL SIGN	QTH
6K24SO	Olympic Village Seoul
6K88SO	Olympic Park, Seoul
6K88YC	Busan Yacht Center, Busan
HL88. .	Individual HL stations in Korea

Applications for all the above awards are to be mailed to: The Korean Amateur Radio League, CPO Box 162, Seoul 100, Korea.

NEW ARRL DXCC AWARDS

See April AR, *How's DX* column for the findings of the ARRL DX Advisory Committee and the refinements and modifications to the DXCC.

MINNET THE MINING NET AWARD

This 300 by 200 millimetre sand coloured award is available to any amateur operator or shortwave listener who gains 25 points to quality for the basic award.

Contact points awarded:

Basic	Two points
Silver	Three points
Gold	Five points
Founder member	Five points
DX contact with Award (any time/ band)	Five points

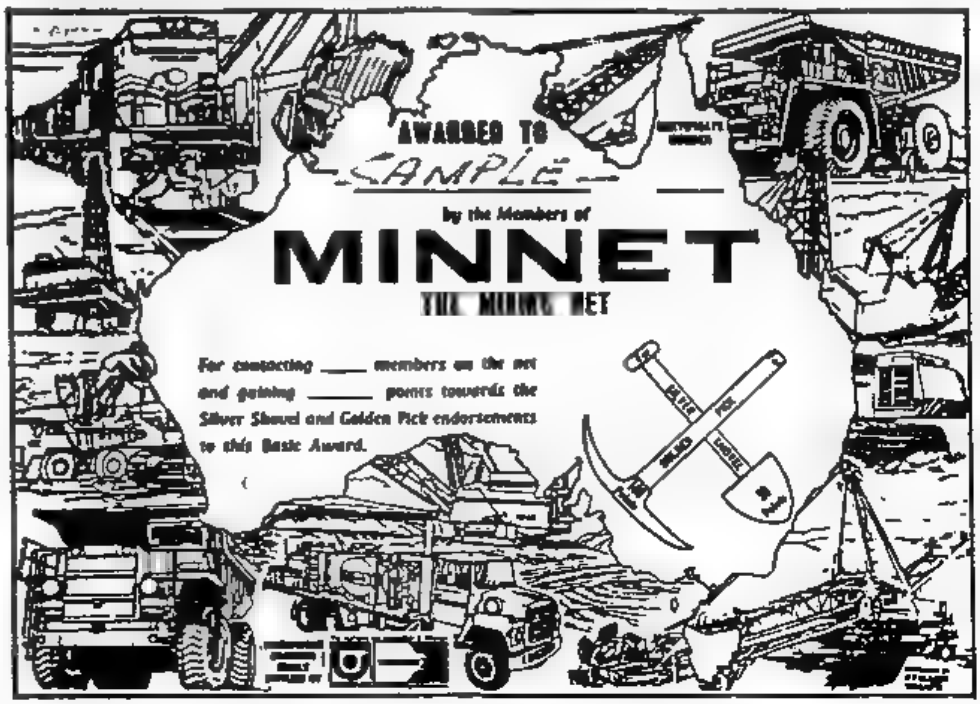
Single contact only for each call sign, which must be on the Minnet Nets. The Basic Award points must include a minimum of three founder members (in more than one State). Minnet Nets on Thursdays from June 1981 to June 1983 are also valid.

A further endorsement, the Diamond Drill, is available for 100 single contacts of 'five point' stations only, ie Founders, Gold and DX Contacts.

Founder members.

VKs — 1KAA/GL, 4IR, 4YG, 4KDM, 4VAO/AHF, 4VHP, 4VHQ/KHQ, 4VIT/VEF/APJ, 5ABS, 5AJW, 5AMH, 5APB, 5GAS, 5NIC, 5NKM, 5PVT (included as second operator), 6PA, 6ANW, 7KTN, 8AC, 8DH and 6NDL

Log details must include contact date, members call sign, award number and points claimed. The Basic Award costs $3 or six IRCs, but for each



upgrade claimed a new endorsed award is sent for the cost of postage only.

Nets are currently held around 3.580 MHz from 1030 UTC on the 13th of each month.

Applications should be forwarded to Minnet Award, Moomba Radio Club, Moomba Camp, PO Box 563, Adelaide, SA. 5001

ARMADA 400

In 1588, the might of Spain was sent against England. Fires lit up along the English coast to warn that the Spanish Armada had been sighted. In Plymouth, Sir Francis Drake calmly finished a game of bowls before embarking against all odds, to fight the world's most fearsome fleet in a battle that remains among history's best remembered.

In 1988, Plymouth England, and the surrounding area will again be the focus of attention when the 400th anniversary of the Spanish Armada is marked by a month of celebrations. Elizabethan banquets, ox roasts and strolling minstrels will be the backdrop to a Grand Finale on July 28, 1988.

During the period July 1 to July 28 1988, if you work at least two members of Plymouth Radio Club and the Special Event Station GB400A on any band you qualify for an Armada 400 Award. Claims plus three IRCs should be sent to the Awards Manager, G3VCN, QTHR.

GOLDEN ANTENNA AWARD

For the seventh year in succession, the town of Bad Bentheim will symbolically award one radio amateur with the Golden Antenna for outstanding humanitarian achievement in the field of amateur telecommunication.

This year, the winner will receive the award during the German Dutch Radio Amateur Week (DNAT) from August 25 to 28.

Organisations of radio amateurs are requested to submit proposals for this award to Stadt Bad Bentheim, Schlobstrabe 2, D-4444 Bad Bentheim, by May 15, 1988.

Applicants should have achieved an outstanding humanitarian feat in the field of amateur telecommunication. The winner will be decided by a committee consisting of representative of the town of Bad Bentheim and the Presidents/Chairmen of the International Amateur Radio Union Vereniging van Experimentee Radio Onderzoek (Netherlands), Vereniging Radio Zend Amateurs (Netherlands), and the Deutsche Amateur Radio Club (DARC).

The town of Bad Bentheim will defray all expenses incurred in connection with the journey and accommodation of the winner. The decision on the award is not subject to the jurisdiction of courts.

—Contributed by Karl Taddey DL1PE, President DARC

1988 POLAR BRIDGE DIPLOMA

The Canadian Radio Relay League is pleased to announce the 1988 Polar Bridge Diploma to commemorate the joint Canadian-Soviet Union trans-polar ski expedition from Severnaya Zemlya, USSR, to Ellesmere Island, Northwest Territories (NWT), Canada.

This attractive, oversize bilingual (English and Russian) commemorative diploma will be awarded to amateurs and SWLs who fulfill the following:

REQUIREMENTS:

Three different calls from NWT, Canada (usually VE8)

Three different calls from Asiatic RSFSR, USSR (usually UA9 or UA0)

One base camp station call from either the USSR or Canada

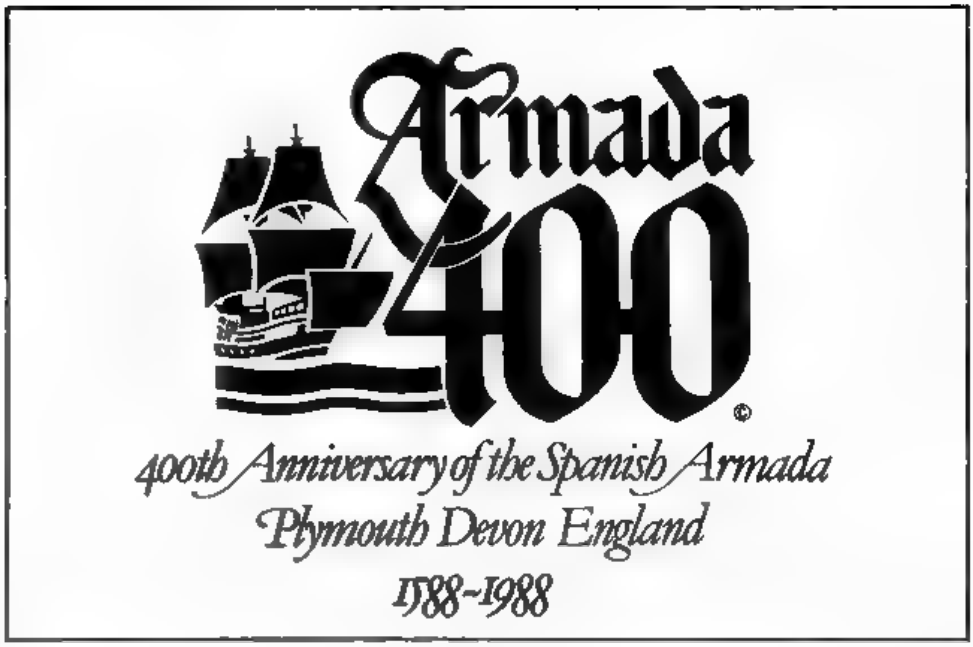
One station from the national capital region of Ottawa, Canada

One station from the national capital region of Moscow, USSR

A total of nine two-way QSOs or loggings.

Contacts must be made between February 15 and June 15, 1988.

Applications, certified log data (no QSLs), 10 IRCS or $5 should be forwarded to the CRRL National Awards Manager, Garry V Hammond VE3XN/VE8XN, 5 McLaren Avenue, Listowel, Ontario, Canada, N4W 3K1



The Canadian DOC has given special permission for radio amateurs in the Northwest Territories (NWT) to use the special prefix CI8 from February 15 until June 15 to publicise the expedition.

The Canadian Base Camp at Resolute Bay, NWT, will use the special call sign CI8C for the duration of the expedition. The station will be manned by a series of operators working in two-week shifts.

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Radio Amateur Old Timers Club

Kevin Duff VK3CV
PUBLICITY OFFICER
RAOTC
10 Stanley Grove, Canterbury, Vic. 3126

The Radio Amateurs Old Timers' Club held its annual dinner and get-together at the City and Overseas Club in Melbourne on March 10, 1988. This was well attended with 45 members present and apologies were received from eight members who could not attend. President, Bill Gronow VK3WG, welcomed members and suggested that, as we have only two social events per year, there should be plenty of time for gossip, which was very well received. During the dinner, members changed tables to have an "eyeball QSO" with old friends.

Later, the President spoke of the passing of John "Mac" McConnell VK3RV, who was a Committee Member and the Victorian Net Co-ordinator for the RAOTC monthly net. Bill said, "It would, I think, be remiss on my part if I didn't mention "Mac" McConnell's name. I'm sure you will join with me in your expressions of sorrow and regret for Mac's passing. He was a most loyal and efficient member of our group and I'm sure those who listen regularly to the monthly broadcast will miss his friendly voice."

Allen Dobell VK3AMD, spoke about television line-frequency interference on amateur and other frequencies and he said, "For some time now, the Federal body of the Wireless Institute has been represented on the Standards Association by Allan Foxcroft VK3AE. One of the projects there is to establish an Australian standard that would limit the emission of television line oscillator harmonics.

"The objectives are to get some idea of how wide this interference spreads ad to get quantitive measurements of real standard that can be measured in micro-volts per metre. When you hear this interference on 40 metres, you are not listening to the first or second or fifth harmonic, you are listening to the 484th harmonic, so we are stuck with the problem."

Allen then played two tape recordings to demonstrate how bad television line interference can be. The first one Allen had recorded showed the effect on a frequency in the 7 MHz band and that was a complete loss of signals. Lay Cranch VK3CF recorded the second tape which was a recording of severe line interference on the VIM frequency of 2.201 MHz. This is the traffic channel of the International Distress Frequency of 2.182 MHz, used by Melbourne Radio, VIM. For people who suffer this television problem, Allen had questionnaire forms that amateurs can fill out and return to him so they can be collated.

Ken Matchett VK3TL, spoke about the QSL cards that he is collecting for posterity, and he said that this was going very well. He now has about 75 000 cards which are catalogued. The collection has about 2500 prefixes and well over 300 countries. Ken would like to have some cards from DXpeditions from the years 1946 to about 1953. If you can contribute any QSL cards, contact Ken at PO Box 1, Seville, Vic. 3139.

After a very enjoyable evening, President Bill Gronow declared the meeting closed at about 11 pm.

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Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW 2868

JOAN AND JAPANESE

I recently received the following article, taken from the Mildura newspaper, featuring Joan VK3BJB. Joan's involvement with the Japanese language and the Okera Net was documented in the ALARA column, *Amateur Radio*, May and June 1987

JOAN'S HOBBY WITH A DIFFERENCE!

Having a hobby as an amateur radio enthusiast is anything but relaxing, according to Mildura's Mrs Joan Beevers.

Mrs Beevers' afternoons, spent monitoring a Japanese radio network, Okera, had her recently embroiled in a search and rescue mission for a lone Japanese sailor

Mrs Beevers keeps in daily contact, via the network with sailors of competition and pleasure craft, which check in with the network

It was during one of these sessions that Mrs Beevers made radio contact with the lone sailor of a 31-foot double-masted ketch, Masao Sato, 38.

Mrs Beevers was the sole radio contact with Sato, who had set out from Fukushima, Japan, in October for Sydney

He had spent 10 years single-handedly building the yacht. *Akizora*, for the trip, which he expected to take three months.

Mrs Beevers spoke daily with Sato, but lost contact on January 13.

His position at that time was south of Sydney, and he was thought to be heading for Bateman's Bay.

After three days of not hearing from Sato, Mrs Beevers started to hold fears for his safety.

The weather reports she had received indicated rough conditions, and she feared the boat had capsized or that Sato had been swept overboard

'My thoughts were that he was hanging on to a piece of wood in the middle of nowhere,' she said

Three days can be a long time especially when you're sailing single-handed, so I thought I'd better check on him and be on the safe side.'

Mrs Beevers reported the situation to Federal Sea Safety, Canberra, on January 16, expressing her concern for the skipper

She was relieved to discover Sato had sailed to Sydney. A sea search had found him safe and well at Rosebay.

As a result of her part in the saga, Mrs Beevers was contacted by the Japanese press. Fukushima News and the Sydney branch of the Kyodo News

'They were surprised how far Mildura was from the coastline,' she said

Mrs Beevers has been involved in amateur radio for 17 years, and spends up to three hours a day monitoring the international radio networks.

In recent years, she has concentrated on the Japanese network, through which she has learned the language.

"It takes me a half a page to say what they can in one sentence, but I get through," she said.

However, her language proficiency was helped by the captain of a container ship who gave her Japanese lessons via radio.

Since joining the network in December 1986 she has witnessed two other sea rescues.

"Oh well, you have to do something to make life interesting," she said.

Joan says that her knowledge of the Japanese language was really put to the test recently when she became "temporary" net controller for the Okera Net on several occasions. The net always seemed to become longer when she took over. It is probably most unusual for a VK YL to control a Japanese maritime net

Many of the Okera group members telephone Joan when they arrive at Australian ports, and most of them speak little English. As Joan says, "Now that really tries out my Japanese, as I can't check my note book or dictionary when I am on the telephone and their coins are running out quickly."

Some of the Japanese fishing boats are away from Japan for up to 18 months at a time, so amateur radio plays an important part in keeping them in touch with friends and family. Joan is happy to play her part in keeping the lines of communication open.

ZK2 YL DXPEDITION

Mary Lou Brown NM7N and Jan Scheuerman WB2JCE were very much in demand when operating as ZK2MB and ZK2JS respectively from February 21 to 27

Subsequently, they visited New Zealand and Australia, and met several of the VK3 ALARA members at the QTH of Mavis VK3KS and Ivor VK3XB. Those present included Bron VK3DYF, Bonnie VK3PBL, Raedie, Gwen VK3DYL, Kim VK3CYL and Liz VK3JQ.

Mavis, the ALARA Awards Custodian, presented Mary Lou and Jan with the ALARA Award, for which they had both qualified during their Niue operation. Mary Lou is the current president of YLRL, Jan is a past president

Unfortunately, Jan suffered a back injury which resulted in her having to cut short her trip and return to San Francisco.

ANOTHER "HOW I GOT STARTED IN AMATEUR RADIO" STORY

This is how Jan VK6PJL started

"I first became interested in amateur radio when my son put a CB in my home, under a lot of protest from me, but he insisted so he could talk to me from Manjimup, about 20 miles away. I was really amazed to hear over east and up north, it was then that my son told me all about amateur radio.

"It sounded good to me, so I made some inquiries and met a couple of amateur operators, then began to study with the novice kit early in 1985. A class opened in July 1986 at Manjimup High School, but because of poor attendance it was put back to every second week, so when 12 months were up we hadn't completed the course, so with the notes from the school, and the novice kit, I finally passed the Morse and regulations in February 1987 sat for the theory in August — 82 percent — failed! While holidaying in Melbourne I sat for the theory in November — passed!

"So after almost three years I am finally on the air and all the time and study was well worth it. I appreciate the help from Trevor VK6ATB and Bob VK6KRC. Also, I found the WIA Morse tapes and text excellent for learning the Morse code."

BITS AND PIECES

Congratulations to our hard-working secretary, Jenny VK5ANW, and OM Mike VK5AMW, who celebrated their Silver Wedding Anniversary in March.

Congratulations also to Liz ex-VK3PSG now VK3JQ, after upgrading in February.

Zdena OK2BBI, enjoyed her visit to Tasmania. She is now back on air from her home QTH with the familiar call sign

It was good to work Bev VK6DE, with the Bicentennial call sign, VI88WA, in early February, and Gwen VK3DYL, signing VI88VIC, in early March. Both were in great demand.

Propagation is certainly improving. On the 220 net recently I worked G4, OK2, WT4, SM5, I5 and ZL, all YLs, and most with strong signals. It is good to catch up with some of our DX friends again.

The call sign VK3EEL, on the 80 metre ALARA net, March 14, had us all guessing. It was Mary Lou NM7N from the QTH of Mavis VK3KS, with whom she was staying for the night.

ALARA now exchanges newsletters with the Dutch YL amateur radio group.

NEW MEMBERS

Welcome to Chris ZL1BQW

ALARA membership continues to grow, and we now have 203 financial members.

Best 73/33, Joy VK2EBX

Joan VK3NLO.

Poppy VK6YF.

Margaret VK4AOE.

AMSAT Australia

Colin Hurst VK5HI
8 Arndell Road, Salisbury Park, SA. 5109

NATIONAL CO-ORDINATOR
Graham Ratcliff VK5AGR
INFORMATION NETS
AMSAT AUSTRALIA
Control VK5AGR
Amateur Check-In 0945 UTC Sunday
Bulletin Commences: 1000 UTC
Primary Frequency: 3.685 MHz
Secondary Frequency: 7.064 MHz
AMSAT SOUTH WEST PACIFIC
2200 UTC Saturday
14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

SURREY TO BUILD NEW UOSAT FOR 1990 LAUNCH

by Doctor Martin Sweeting G3YJO, University of Surrey

The UoSAT Spacecraft Engineering Research Unit at the University of Surrey (UK) is now building a third UoSAT OSCAR spacecraft: UoSAT-C. NASA has agreed to provide a launch for UoSAT-C on a DELTA launch vehicle currently scheduled for late 1988. The DELTA should place UoSAT-C into a 43 degree inclination, 500 kilometre circular orbit.

UoSAT-C will carry experimental engineering, science and communications payloads developed in close collaboration between international professional engineering and amateur radio communities. These payload experiments develop further the mission objectives supported by the highly-successful UoSAT-1 and 2 (UoSAT OSCAR-9 and UoSAT OSCAR-11) satellites which are still operational after six and four years in orbit respectively. The UoSAT Program and series of satellites are intended to complement the AMSAT OSCAR, RS and FUJI OSCAR amateur radio communications satellites. They provide a space science and engineering facility readily available to both amateur and professional experimenters. Greater mutual awareness and collaboration are thus promoted.

In common with prior UoSAT missions, UoSAT-C will have a strong element of international collaboration — especially with members of AMSAT-UK, AMSAT-NA in the US and Canada, VITA, Quadron, NASA, the British National Space Center and the European Space Agency.

UOSAT-C PAYLOADS

Store-and-Forward Communications

Since 1983, UoSAT has played a major role in an international collaborative project developing cost-effective digital store-and-forward satellite communications techniques. The UoSAT OSCAR-11 Digital Communications Experiment (DCE) — funded by the Volunteers in Technical Assistance (VITA) and built by VITA/AMSAT volunteers in the USA, UK and Canada — provided the first operational tests of store-and-forward PACSAT communications within the Amateur Satellite Service. Drawing on the operational and engineering data gained from the DCE, UoSAT and VITA are developing a high performance digital store-and-forward communications payload specially tailored for use by inexpensive ground stations. To test this payload, UoSAT-C will carry the PACSAT Communications Experiment (PCE). The PCE will be openly accessible to radio amateurs operating in the two metre and 70 centimetre bands (Mode J). VITA is seeking additional frequency allocations outside the amateur bands to allow limited use of the UoSAT-C PCE by VITA ground stations in remote areas to provide technical assistance and disaster relief.

Radiation Studies Experiments

Microprocessor-controlled payloads such as the PCE cannot be built without VLSI semiconductors, and most recent and affordable VLSI devices have not yet been tested for space use. UoSAT-C will host several experimental payloads studying the effects of the space radiation environment on VLSI [redacted]

Cosmic Particle Experiment (CPE)

Comprising an array of large area PIN diodes, will detect energetic particles which cause single event upsets (SEUs) in VLSI circuits (such as high-density RAMs).

CCD Single Event Upset Experiment

(CCD-SEU) comprising an enclosed Charge-Coupled Device (CCD) array, will detect energetic cosmic particles and evaluate the effect of SEUs on CCD imagers. This data is of particular importance for scientists using sensitive CCDs as star [redacted]

Total Dose Experiment (TDE)

Using special FETs located around the spacecraft, will measure the total radiation dose accumulated by the on-board sub-systems and payloads. These dose measurements will allow engineers to assess the shielding properties of the spacecraft structure, and to correlate changes in LSI-device power consumption and performance with total radiation dose.

Satellite Technology Experiments

UoSAT-C will carry a range of satellite technology experiments associated with power systems, on-board data handling (OBDH), attitude determination, control and stabilisation (ADCS) and RF modulation.

Power

The spacecraft will be powered from GaAs solar cells and will include experimental patches of novel GaAs, InP and Si solar cells with a variety of newly-developed cover-slides. The performance of these cells will be monitored throughout the mission as a function of radiation dose. The spacecraft onboard computers will constantly and adjust the Battery Charge Regulator and Power Conditioning Module to optimise power conversion and storage efficiency.

OBDH

UoSAT-C will include several computers. In addition to the primary RCA 1802 on-board computer (OBC-1) running diary-type software, there will be a more powerful 80C86-based OBC-2 supporting complex attitude control algorithms and spacecraft data networks. Four transputers in a parallel-processing array will be available for highly sophisticated on-board image and data processing, and the PCE will employ an 80C186-family computer to manage high-speed communications links and several megabytes of RAM.

A wide range of memory devices using different technologies and architectures will make up a total on-board capacity of around five megabytes of RAM. The radiation-induced effects on the processors and associated memories will be monitored and evaluated throughout the lifetime of the spacecraft. The network of computers on UoSAT-C will make this spacecraft the most computationally powerful of its class and will support demanding experiments in advanced spacecraft attitude determination and control, data communications and image processing.

ADCS

The 43 degree inclination, non-sun-synchronous nature of the UO-C orbit will necessitate the use of new attitude determination and control mechanisms to maintain accurate Earth-pointing. In addition to more complex attitude control algorithms executed by OBC-2, improved analogue and digital sun sensors and Earth horizon sensors are being developed at UoS for the mission.

DSP

If time and resources permit, a Digital Signal Processing Experiment may be include on UO-C to evaluate modulation/demodulation schemes.

A new concept of highly modular construction has been developed and is under test for UoSAT-C. This new, modular structure should result in much improved utilisation of the available spacecraft envelope, greater ease of assembly and integration, and allow a more rapid response to future launch opportunities.

FOR THE USERS

Like UO-9 and UO-11, UoSAT OSCAR-C will support a world-wide user community of engineers, scientists, educators and communicators. If all goes according to plan, UO-C will provide spacecraft housekeeping telemetry, long-term telemetry surveys, results from on-board experiments, news bulletins and communications facilities on a single downlink through packet-radio techniques. We will finalise and publish communications modem and protocol details as soon as possible, to allow ground-stations to equip themselves.

Whilst numerous international teams are already collaborating on UO-C, UoSAT is interested in hearing from others interested in possible collaboration, especially in the area of user ground-station support.

The UoSAT team are happy to be able to make a public announcement of the UoSAT-C mission, and we hope that it will contribute to the long history of successful and technically important OSCAR and RS missions and maintain the tradition of international collaboration in the Amateur Satellite Service.

IARU TO JOIN INTERNATIONAL COMMITTEE ON RADIO INTERFERENCE

The President of the International Amateur Radio Union (IARU) has applied through the Central Office of the ICE for the admission of IARU as a Member Body of the Committee on Radio Interference (CISPR). The IARU is the international organisation of amateur radio societies, representing approximately 125 such national organisations.

The President of IARU has stated that through membership in CISPR they could on the one hand share some of the knowledge accumulated by the members of IARU and, on the other hand, could benefit from the interchange with the members of the CISPR. IARU would intend to be an actively participating member of CISPR.

This application was considered by the Steering Committee at its meeting held in Cagliari in June 1987, and it was decided to recommend to the Plenary Assembly that the IARU be admitted as a Member Body of CISPR.

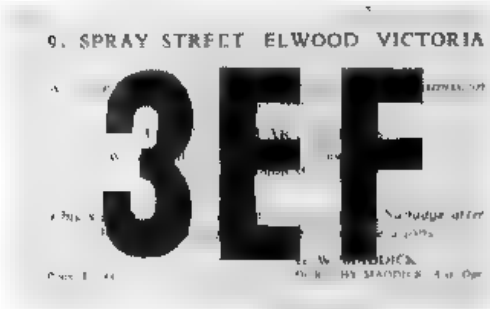
The WIA is already a member of the Standards Association of Australia and, through it, contributes to the work of the IEC and CISPR. The direct representation of the Amateur Service on the international body will assist in the presentation of the amateur viewpoint at the highest level.

Contributed by Allan Foxcroft VK3AE

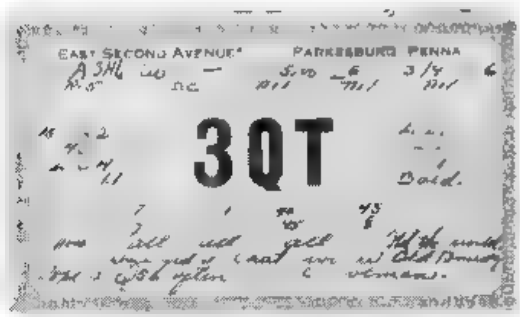
QSLs from the WIA Collection

Ken Matchett VK3TL
776 Warburton Highway, Seville, Vic. 3139

Before the allocation of the A (for Australia) and later the OA prefix (at the time referred to as an "intermediate" standing for Oceania-Australia), our experimental stations were allocated call signs simply consisting of a numeral (representing the Australian State) together with two letters. The call sign 3EF belonged to the late Bert Maddick. He was one of the experimenters in those early days to operate on the commercial broadcast bands.



Note the comments on his QSL card about his period of operation. In those times one usually referred to wave lengths rather than frequencies. His station's wave length of 239.9 metres corresponds closely to 1.250 MHz, just below Broadcast Station 3AW on the dial. Power used was only 150 watts to the crystal-controlled master oscillator power amplifier (MOPA). In those days crystals for a given frequency were issued to certain stations by the WIA. Transmission of music was permitted but there were strict laws governing the conduct of the station. The story of Bert and his talking parrot is well-known to many old timers. It would seem that Bert was minding the bird for a friend who must have neglected to tell him that it could swear like the proverbial trooper. Imagine the consternation of all when the wretched bird, in an unguarded moment, gave an impromptu performance over the air. Bert was "hauled over the coals" and may have been fortunate in retaining his licence. History does not record what Bert said to the bird.



The QSL card, 3QT from the United States of America, dated 1926, is one of many of this period in which the station call sign gave no indication of the country of origin. Transmissions in the early 1920s were really local affairs, so country designation was not an important factor.

After all, it was not until 1924 that the first QSO took place between Australia and New Zealand. Even when DX was firmly established, many station operators still preferred to retain their old call signs rather than use letters in their call signs to indicate the country, such as U3QT (USA), A3QT (Australia), C3QT (Canada), and so on. C Coleman states on his QSL card he had worked DX over 11 000 miles, together with all States and call districts of America. This QSO with the late Alan Hutchings A3HL, of Victoria, must have been, nevertheless, quite an achievement for him.

The QSL, X2N from Mexico, dated October 10, 1935, might seem to be missing in E from the usual XE prefix. The provisions of the 1927 International Radio-telegraph Convention (IRC) became effective from January 1, 1929. The allocation to Mexico was XAA to XFZ, and it was left to the Mexican Government to allocate to amateurs in that country the actual prefix to be used.

The Government decided to allocate the prefix X. The 1929 edition of the ARRL *Radio Amateur's Handbook* states in a footnote on page 189 that this prefix was "improperly assigned by Mexico. Should have two letters to distinguish from China".

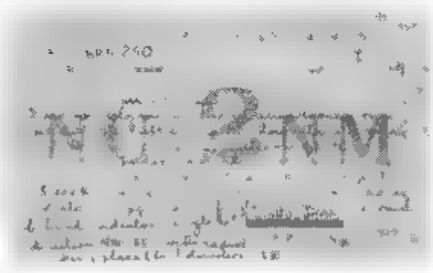
It should be noted that China's allocation was, at that time, XGA to XUZ. Later Mexican amateurs were assigned the prefix XE used to this day, but the Government was free to have used a range of prefixes. It has used the XF prefix too, XF zero being used for club stations and XF4 for the rather rare ARRL DX country, Revilla Gigedo.

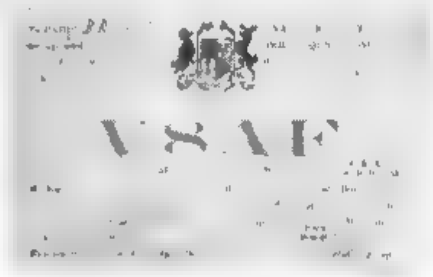
The XE4J QSL card, dated March 1973, is from the Benito Juarez Island of the Revilla Gigedo archipelago. This ARRL DX country is situated approximately 19 degrees north and 111 degrees west, which puts the four island group in the Pacific Ocean some 800 kilometres west of the Mexican coast.

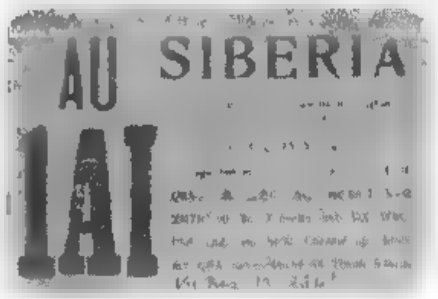
Its coasts are very steep and there are few sand shores, the island being mainly formed of volcanic lava from its extinct volcanoes, the QSL indicating their position on the island. Revilla Gigedo was added to the ARRL countries list in August 1956, credit being given from October 1, 1956, for contacts on or after November 15, 1945.

The prefix was XE4, later to be changed to XF4.

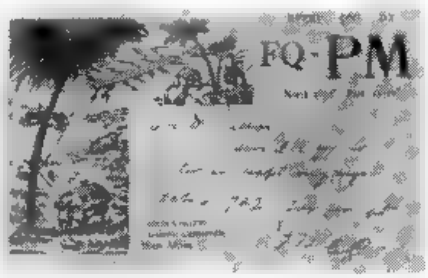
It is probable that the island group derived its name from Count Revilla Gigedo, an early administrator of Mexico under the Spanish Conquistadors.

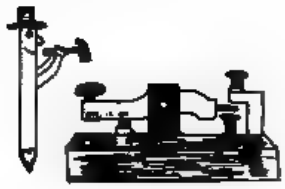






Antique QSL cards courtesy VK6ME & VK3AH





Pounding Brass

Gilbert Griffith VK3CQ
7 Church Street, Bright Vic 3741

I am writ ng to you from downtown Bright where the whole countryside is sparkling after the recent rain It is the week before the John Moyle Field Day Contest and I am in a panic. I do not know whether to carry on with this month's column or get all the equipment ready for next Saturday. We have a new member of the family to look after as well, a rescued joey (joeyette?) of about six months, named Min, because our first joey was named Eccles. Believe me, they take more looking after than children!

Now, the contest! My worry list this year starts with having to make a table to fit in the van, all the power leads for two sets of batteries and two solar panels, and an antenna for the higher bands as well as an 80 and 40 metre dipole used last year. But where is it? Not to mention that, if it were a real emergency, there would be other things to worry about as well But, of course, that is the whole purpose of a field day, fun and games. Anyway, that is past history now, and I hope you all enjoyed yourselves. I know I w ll although it does not seem that way right at this time!

Consequently, this month is going to be a hodge podge. Do you remember I mentioned that I have joined the CW operators QRP Club? The latest newsletter has an advertisement for the "club communicator kit-set" by Don VK5AIL. I am not going to try and trick you into joining, but if this is the sort of benefit they provide, then I think you could maybe th nk twice about it. The problem is that the kit is only available to members of the club and I have not spoken to Don about mention ng it in *Pounding Brass*. You can negotiate with Don or the club yourselves.

The Club Communicator is an 80 metre band QRP CW transmitter, maximum power up to 5 watts. The full kit set comprises four modules and a set of miscellaneous components.

The modules are

VFO . . Variable frequency oscillator, 7.0 to 7.4 MHz, adjustable by you.
BDT . . Buffer, divide by two, timer.
PA . . Power amplifier.
QSK . . Keying board.

You can buy the full kit set or individual modules.

My suggestion is for you to contact Don for more information. Even if you include a year's membership in the cost of the kit I think you will find it money well spent. Building such a kit is the best way to learn and you will not have to chase all the separate bits as I did for my QRP transmitter. (And, mine is still not operating properly, either!).

THE SPANISH MORSE TEST

from Morsum Magnificat by Mike Molina EA3FHC

Until 1978, there was an amateur Morse test in Spain the same as in every country in the world. But, in 1979, the administration launched a bombshell . . deciding that the Morse test was no longer necessary for an amateur radio licence.

Most people were delighted with this news, especially those wanting to become amateurs. There were those who spoke up against the change, but not too many. The fact is, the majority were happy with the new arrangements. It is sad, but true, that they dislike the Morse test.

The administration made its decision without consulting amateur organisations, although a few people believed there was some sort of agreement with the principal associations. Naturally the national society, URE, as a member of the IARU, objected but many of us thought they did not protest vigorously enough.

Why it was decided to abandon the test despite the international regulations I cannot say. Why do governments do what they do? Nobody knows exactly, but everyone has their own ideas. It is hard to understand, however, how the Spanish administration could subscribe to WARC-79 and abrogate the amateur Morse test in the same year.

The result was a doubling of amateur radio licences in three years from 15 000 to 30 000. We are more, but not better, and may be worse in some ways. Since then there has been a "cold war" between Morse defenders and non-Morse amateurs who accuse us of being "a minority wish ng to impose an obsolete mode of transmission on the majority." They are right about one thing We are a minority, but we want to keep the spirit of amateur radio alive. We have had to swallow all kinds of accusations.

Despite all this, there have been a number of groups fighting for the return of the amateur Morse test One such group is the Hispania CW Club (HCC) which came into being as a result of the administration's action, and we have two hundred members.

In May 1986, came another bombshell Morse became obligatory again for amateur radio! There was more controversy than ever before! There are now three licences, Class A, requiring 12 words per m nute code. Class B, no code, VHF only; and Class C, novice, eight words per minute, although those who gained their licence earlier do not have to take the new Morse test. S nce 1979, however, many of us have taken a voluntary Morse test to demonstrate our disagreement with the administration.

Amateur radio opinion was taken into account in framing the new regulations and as a result, we now have one of the more progressive licence structures in the world During the non-test period it was the opposite and many countries refused to recogn se the Spanish licence.

Now Morse telegraphy is on the increase n Spain. Morse courses are full with long waiting lists, but a few months after the Morse test came back out of 30 000 amateurs there were still only 400 who knew Morse code!

For my final this month I do not really want to mention it but I am very disappointed Back in October last year, I said that Bill VK7NRV had suggested to me that we take up a collection for a memorial trophy for the late Clive VK3CQL. I have had no replies. So Bill, it is up to the two of us. I will therefore arrange a trophy as soon as possible and we can have it presented to the Novice CW Winner later this year

CUL ES 73 VK3CQ

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IONOSPHERIC SUMMARY

The IPS summary for January contains the following information.

The monthly values are as follows 10 cm flux 108.9, Sunspot number 59.6. A index 10.3, and three flares

IPS predicted sunspot numbers from August 1987 to July 1988 are August 35, September 38, October 41, November 43, December 46, January 49, February 53, March 57, April 60, May 64. June 69, and July 74. An interest ng observation is that for January 1988 they predicted 49, whereas earlier the monthly average was given as 59.6. More about this later

General comments are — solar activity was low in January with the exception of an X class flare on January 2, and two M class on January 14. The X class flare came from a region which had threatened energetic flares in late December, but did not produce anything until the above mentioned flare.

The monthly averaged 10 cm flux value was the highest since May of 1984 continuing the rapid rise of the new cycle. The daily flux value of 127 on January 16 was the highest single daily value since May 23, 1984.

The first half of January was disturbed with several disturbances including a very severe disturbance on January 14 and 15 when two M class flares occurred. There was a sudden commencement in the field at 2328 UTC. The field continued at storm levels through to 1200 UTC on January 15.

For Sydney there was a strong shortwave fade out late on January 2 due to the X class flare. On January 3, MUFs were moderately depressed until 1200 UTC, but were higher than predicted values for the day. January 6 and 7, MUFs were severely depressed until around 1100 UTC on January 7 On January 14 and 15 there were very d sturbed propagation conditions due to the intense geomagnetic storm and MUFs were severely depressed from 1800 UTC on the 14th to 0700 on the 15th

HF propagation conditions were generally good because of the strong solar flux values throughout the month

The way the sun is behaving it is possible we may be in for a record cycle Doctor Thompson of IPS, observes that there are a number of aspects which are shaping up for this cycle to be the most active solar cycle since observations began about 300 years ago. If this does occur, there will be other things besides amateur radio that will observe the effects.

Compiled by Frank Hine VK2QL

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Electro-Magnetic Compatibility Report

Hans Ruckert VK2AOU
EMC REPORTER
25 Berville Road, Beverly Hills, NSW 2209

This EMC-Report is reprinted from a very informative paper published in the RSGB magazine* Radio Communication, *June 1987, and is a continuation from last months article.

"Were you on your radio last night?"

Angus McKenzie, MBE, FIERE, FAES, CEng, G3OSS
57 Fitzalan Road, Finchley, London, N3 3PG

Part 2: EMC TESTING OF TELEVISION SETS AND TYPICAL RESULTS

LAST MONTH I explained how RF breakthrough can get into a television installation, and I also gave details of the typical performances of some filters which can be used to cure many breakthrough problems. In this second part I describe how my friends and I set about testing nine television sets in the four areas referred to last month, direct coaxial inner pick-up, braid pick-up, mains lead pick-up and direct pick-up on the chassis

THE TEST EQUIPMENT

I was fortunate enough to have the loan of a Philips professional video waveform generator and transmitter, which was used to generate excellent static pictures with every conceivable kind of colour and grey scale indications. This transmitter had a 50 ohm output impedance, and could be switched to various channels used in the testing. The output level was high, and was attenuated with high quality Marconi UHF attenuators, such that the final level reaching the set was of the order of 1mV (EMF/2). A Marconi 2019 signal generator was used as a breakthrough signal source, amplified by a Marconi wideband RF amplifier of 50 ohm impedance. The signal generator was modulated at 1 kHz, 80 percent AM. The output from the amplifier passed through a Marconi UHF attenuator into the injection system

A large, thick metal sheet was securely mounted on the test bench, and a terminal banana socket soldered on to its end, so that this could be interconnected with the earth connections of the various injection boxes. Each television set in turn was placed on the sheet, and connected to the mains injection box and to either the coaxial inner injection or the braid injection system

For the chassis injection tests, each set was placed in the cradle, which allowed the set to be rotated horizontally and vertically in the transmitted field. Off air signals had to be used for these tests, as the Philips generator was slightly disturbed itself by the strongest fields. Extremely good filtering was employed, both on the inner and outer, to ensure that a completely clean signal on Band 4 was reaching the antenna socket. The mains was also extremely well filtered at the set, so that any breakthrough was clearly caused by direct pick up within the set itself.

A Surrey Electronics active antenna system was used for measuring the field strengths induced in the neighbourhood of the sets, the active antenna output feeding into a Marconi 2382 spectrum analyser. Field strength at 144 Mhz were estimated by using back to back balanced dipoles, and comparing the levels transmitted from a Trio TS711E with the level received on the Marconi 2382 analyser. These levels were compared with calculated field strengths, and proved to be very close to them.

For the low frequency field tests, I used my three band trapped dipole — which goes over the roof of the house for the 1.8, 3.5, and 7 MHz bands. For HF tests, I rotated my high-gain TH6 to create the highest field in the set's vicinity on the 14, 21 and 28 MHz bands. I used my Trio TS940S transceiver through a Drake L7 linear, with a Bird throughline watt-meter in the antenna feed for measuring power, also noting this on a separate PEP meter.

COAXIAL DIRECT INJECTION TESTS

I chose to use an MCL 50 ohm hybrid transformer, rather than a resistive pad, for coupling the television signals with the interfering signal, as the system loss would be lower. This allowed higher breakthrough injection levels to be achieved. The output from the hybrid was resistively matched to 75 ohms, and the cable to the television set was kept as short as possible, consistent with the hybrid transformer etc being well earthed to the earth plane. Either a BNOS 150 MHz lowpass filter, or a Microwave Modules 432 MHz bandpass filter was used in series with the breakthrough source. This ensured that there was no significant noise or generator harmonics being injected from the wideband amplifier in Bands 4 and 5 when the intended breakthrough signal was from 1.8 to 150 MHz, or at 432 MHz

Each set was adjusted to give the best possible picture from the fixed transmitted pattern, and the audio gain was set in a typical position required for a reasonable reproduction level. Modulation from the Philips generator was then switched off, and the breakthrough injection switched on at a high level. Not only did we check the picture grading at pre-set breakthrough levels, but we also varied the level to see at what point picture quality would be Grade 2, and on the borderline between Grade 4 and Grade 5. Grade 2 represents what we all agreed was an unbearable degree of breakthrough on what was a reasonably-discernible and stable picture. Grade 4 was described as very slight breakthrough which would not be considered serious at all. Not only were all the amateur radio bands checked between 1.8 and 432 MHz, but the generator was also swept slowly from 1.8 MHz to 150 MHz, particular attention being paid to frequency bands in which there is a likelihood of strong commercial, public, military and PMR transmissions being received in a domestic environment (eg general shortwave frequencies, Band 2 FM radio, air band, and various PMR bands). For the sake of time, the generator was stepped in 100 kHz intervals up to 30 MHz, and in 1 MHz steps above this frequency. Apart from some predictable problem frequencies, such as 6 MHz, the video/audio channel spacing, previous tests had shown that spot frequencies in between the megahertz steps always correspond with the results achieved on the 1 MHz step points, breakthrough vulnerability generally being fairly broad banded at VHF

COAXIAL BRAID INJECTION TESTS

One of my helpers constructed a box in which the interfering signal was injected in series with the braid. The input coaxial cable was earthed to the box, and this was bonded to the earth plane and to the earth on the mains injection box. A 50 ohm screened dummy load was plugged onto either the mains injection box input or the braid injection box input when these were not in use at the time.

Various filters were placed in the leads between the injection boxes and the set in order to check that they were appropriate, and both the braid and inner filter systems worked very well on each set. We often found that the position of a braidbreaker was critical, bearing in mind that the braid could itself radiate directly into the set's chassis. Sometimes it was better to put the braidbreaker at the injection box end rather than on the set's antenna socket, and this is an important guide to a solution in many typical cases

MAINS INJECTION TESTS

The mains injection box, again a screened metallic one, has an IEC mains input socket at one end, and a feed socket at the other, allowing it to be inserted in series with the mains. The injection signal, fed via a 50 ohm chassis mounted BNC socket, was fed onto live and neutral lines, the earth being directly connected to the metal earth sheet underneath the set. Note that all the television sets had only a two wire mains connection lead, which was kept as short as possible. This was achieved by folding them haphazardly, but with care, to avoid inserting any significant amount of inductance between the injection point and the set, as the organisation which loaned the sets was not too keen on us shortening the mains leads! Injection levels corresponded to draft recommendations being discussed in Europe at the moment.

VIDEO AND AUDIO BREAKTHROUGH

Pre-prepared forms were filled in on the spot, and a distinction was made between picture deterioration and breakthrough of the interference modulation into the audio circuits. No attempt was made to effect any improvements within a set itself, nor was there any time to determine precisely where, within a set, which particular circuit was causing a problem. In general, Fiona, my wife, graded the picture quality, and I graded the audio. However, quite frequently one of my friends joined in the evaluations, and we were all pleasantly surprised that judgments were very consistent

RF FIELD/CHASSIS PICK UP TESTS

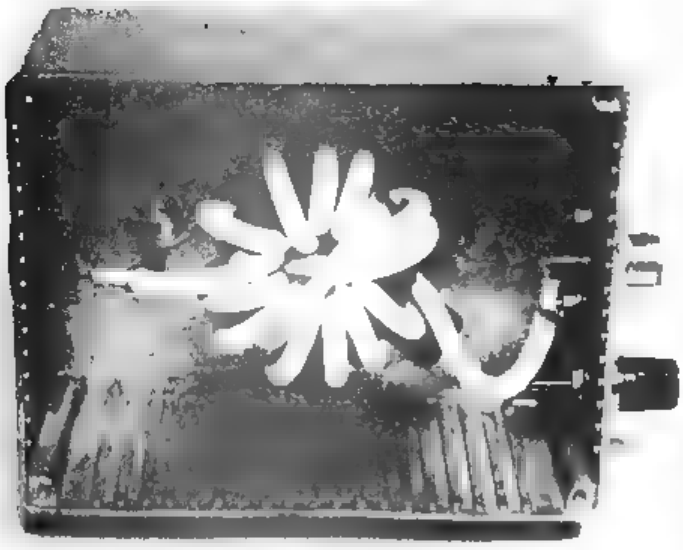
These tests were carried out in three separate groups, the lower frequency band tests being done over one period, the HF ones on another and finally the 144 MHz breakthrough tests. Note that each set was individually rotated horizontally and vertically in the cradle for the worst pick-up for each band, and this position was used for the measurements. The following maximum field strengths were used for the various bands

1.8 MHz — 5V/m, 3.5 MHz — 8V/m, 7 MHz — 10V/m, 14 MHz — 10V/m, 21 MHz — 9V/m, 28 MHz — 5V/m, 144 MHz — 6.5V/m

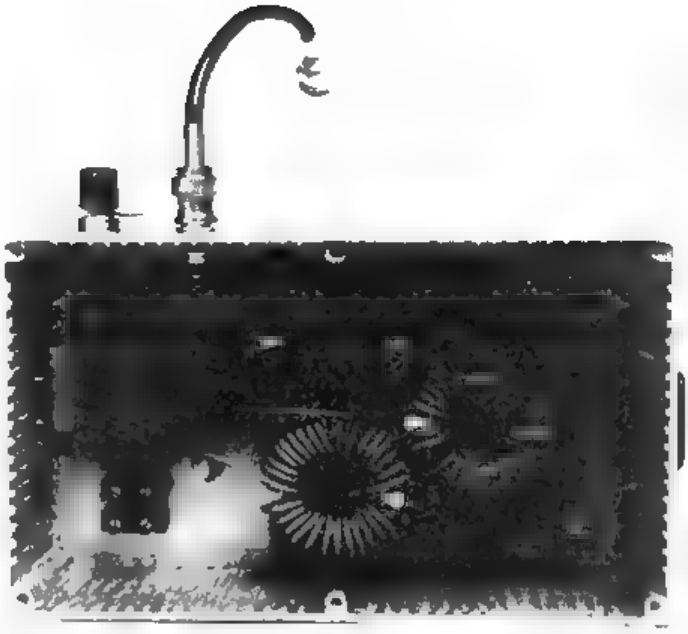
The total amount of time taken over the actual tests, and in report writing, was about one month, although many weeks of preliminary work was carried out earlier in the year, the main tests being in October 1986, for publication in a consumer magazine in January 1987

THE TESTS RESULTS

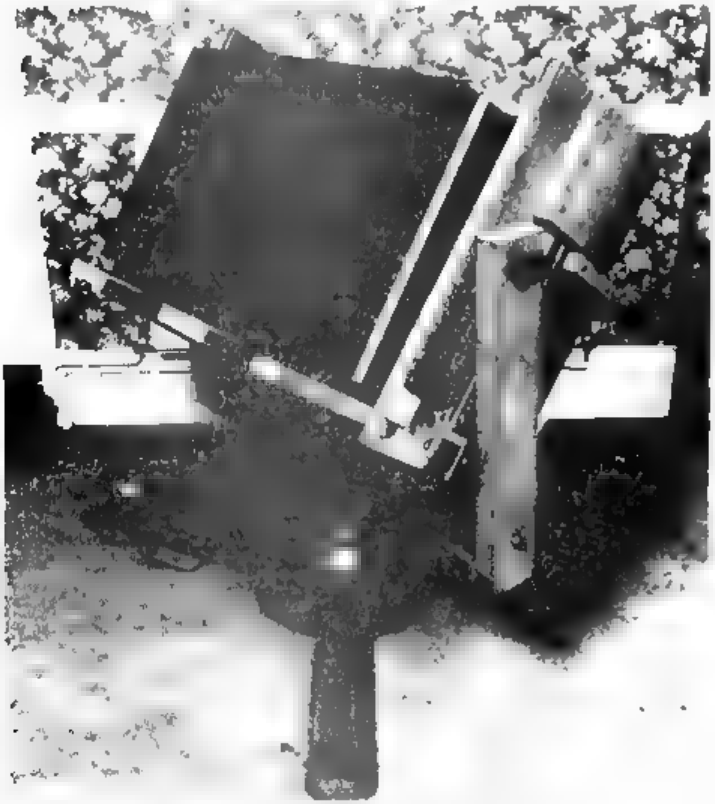
All the sets tested would be classed as being made by well-known television manufacturers and there was good representation of Japanese, German, Dutch, British ad other European-made sets. After much consideration, I feel that it is correct to name the two best sets, but the identity of the remainder will not be disclosed. Only one sample of each set was tested, and I am totally satisfied with a good result, but poor results can occur on a one-off basis — although I am reasonably confident that the results are typical of each brand. In this article, I am primarily concerned with the EMC of the different sets with reference to amateur radio bands, but vulnerability to any of these bands will almost inevitably cause a set to be just as vulnerable to other transmissions as well in the same frequency region



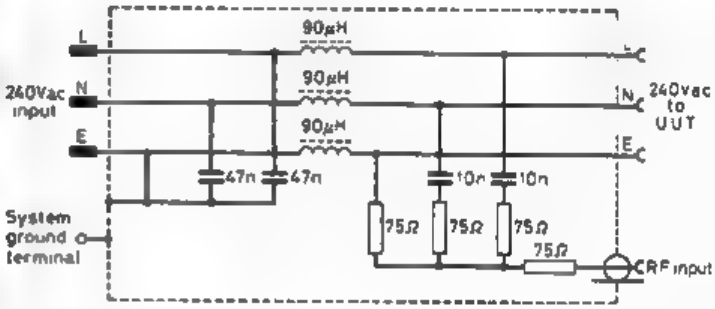
Interior view of Braid Injection Box.



Interior view of Mains Injection Box.



The Testing Cradle.



AC Mains RF Injection Box Circuit Diagram.

Set	1·8 to 14MHz	21MHz	28MHz	144MHz V/A grades for 6·5V/m	Comments	144MHz video for 3·2V/m	Audio for 3·2V/m	Field for Grade 5 V&A V/m
B & O LX2500	5	5	5	4/4		5	5	3 5
Toshiba 26154B	5	4	5	[illegible]	Almost entirely audio breakthrough on 144MHz	4 75	2	0 75
A	5	5	5	0/0		2	2	0 35
B	5	5	5	1/2 5	Almost entirely video breakthrough on 144MHz	2 5	5	0 5
C	5	5	5	0/0	Set muted	3	4	1
D	5	3	5	0/0	Very bad video and audio breakthrough on 144MHz	0	0	0 25
E	5	2 5 (V&A)	4 5 (A)	1 5/1 5		2 5	3	0 4
F	5 *	4 (V)	5	1/5	Picture degrades fairly slowly with increased level at 144MHz	2 5	5	0 28
G	5	5	5	2/1		3 5	2	0 26

Table 1: Field Test Performance.

The Bang and Olufsen LX2500

Direct injection: From 1.9 to 30 MHz this set gave a superb performance, no breakthrough being noted to video or audio, even at 14 volts, the maximum level used in this test. However, above 48 MHz problems were noted, at 50.2 MHz the performance was bad, while at 70.2 MHz results were poor. The onset of breakthrough was very rapid indeed above 48 MHz, for only a 6 dB increase was required to degrade the picture from five down to two. The vulnerability was also poor up to Band 2, but had improved markedly by 144 MHz to become good. At UHF, a fairly low-level signal caused a marginal deterioration, but an extremely large increase was required to create a really serious problem. Even a one volt signal did not cause really serious break up, and there was no audio breakthrough at UHF. Thus, the only bands likely to cause a real problem would be 50 and 70 MHz, but a highpass filter should completely cure any breakthrough, and for this reason the set's immunity was considered excellent, the best of any set tested.

Braid injection: The set was excellent up to 30 MHz, with just a very slight breakthrough at 14.2 MHz with the highest interfering level. A tendency to audio breakthrough was not a problem. A braidbreaker should amply sort out the audio problem.

Mains injection: The only problem noted in this test was at the 6 MHz spot frequency, thus showing first-class mains filtering within the set.

Field immunity: The performance was spectacularly good on all amateur bands tested. (1.8, 3.5, 7, 14, 21, 28 and 144 MHz). A set that shows no discernible trouble at 3.5 V/m and only marginal trouble at 6.5 V/m on 144 MHz SSB is one that might be considered a standard against which others might be judged. This is the type of performance that we are all looking for in a television, showing considerable care and attention being taken at the design stage.

As this set was so good and both the picture and audio quality was among the best noted by my family and others, I actually decided to purchase one of these models, and here has not been a peep from Fiona over the months that we have had the set, despite my being active on all bands.

Toshiba 28154B

Direct injection: This set was remarkably good right across the board from 1.8 up to 432 MHz, the antenna circuit clearly having an excellent highpass filter action.

Braid injection: All the lower frequency bands had excellent immunity and just slight audio breakthrough was noted at HF at extremely strong injection levels. On the 50 and 70 MHz bands, immunity was quite good, but with a slight tendency to audio breakthrough from strong interference levels. Although breakthrough on 144 MHz, primarily on audio, was fairly good, more breakthrough was noticeable around 139 MHz. 432 MHz rejection was excellent.

Mains injection. Audio breakthrough was slightly noticeable here and there between the 3.5 and 21 MHz bands, although by 28 MHz there was no problem even at high levels. Strong injection signals were required to cause any audio breakthrough on the 50 and 70 MHz bands. Even at 144.3 MHz, the immunity was quite good at the highest levels, and a ferrite ring braidbreaker should be sufficient if placed very near the set. No problem was noted at 432 MHz.

Field immunity test: Immunity on the lower frequency and HF bands was excellent, and some 9 V/m were required at 21.2 MHz to cause very slight audio breakthrough, which is considered remarkable. On the 144 MHz band, video immunity was very good, but audio breakthrough became progressively more and more marked when the field strength was increased above 0.75 V/m. Audio breakthrough was annoying above 1 to 1.4 V/m, and this is a pity on an otherwise superb set.

Set A — A Far-East Company product made in the UK

Direct injection: This set performed adequately at lower frequencies and well at HF and VHF. At UHF, performance was clearly better than average. However, this particular set showed bad picture deterioration after about half-an-hour from switch-on, and the picture without breakthrough was itself no better than Grade 4.

Braid injection: This set was very poor overall above 4 MHz up to UHF. The set could be said to be disastrous between 6 and 8 MHz, and extremely poor at HF and at 144 MHz. This is one of the worst sets tested in 1986 in this parameter, and it is quite clear that it could give trouble in many areas from many different types of local transmitters. An unfortunate example of a set with good rejection on the inner, but very serious problems in the complete earth plane within the set.

Mains injection: This set proved to be more than usually troublesome over a fairly broad lower frequency and HF spectrum, although by the 144 MHz band there was almost no trouble at all. Some audio breakthrough was picked up at 432 MHz. Strange problems were noted at 6 MHz together with its harmonics, eg 18 and 24 MHz. This set might very well require an efficient ferrite ring mains filter near the set, as well as a very effective braidbreaker on the antenna lead.

Field immunity: The chassis immunity was surprisingly good on lower frequencies, HF and lower VHF, but at 144 MHz strong signals did cause quite a severe problem, especially to the video. The field strength had to be reduced to only 0.35 V/m on 144 MHz for breakthrough to be eliminated.

Set B — Made in the UK by a British Company

Direct injection: This set performed admirably from 1.8 to 100 MHz, no trouble showing up either on video or audio. However, at 144.3 MHz video breakthrough was extremely bad at the one volt level, but the signal only had to be reduced by 10 dB to obtain a perfect picture; audio showing no deterioration. At 432 MHz the set muted completely, and Grade 5 video required a breakthrough signal reduction by 15 dB to only 55 mV. The picture was as bad as Grade 2 at 125 mV, muting occurring at 250 mV. The problem is clearly that of insufficient front end selectivity, and reception was perfect with a one volt input signal when a six-section filter was inserted on the antenna input socket, a tuned notch filter giving an almost perfect picture. All the problems were video rather than audio.

Braid injection: This set showed serious problems on almost all bands from 7 to 144 MHz in varying degrees, 144 MHz audio was mainly affected. Even a good braidbreaker on the input socket was insufficient to effect a cure, as re-radiation from the coaxial lead braid to the chassis created a problem.

Mains injection: There were no significant pick up problems below 30 MHz, and above 30 MHz the performance was quite acceptable, although very high injection levels on 144 MHz did breakthrough, the onset of the problem being quite sudden, primarily onto audio at VHF and UHF.

Field immunity: Chassis immunity was excellent on the lower frequency and HF bands, but on 144 MHz breakthrough to video was very bad at high field strengths, and did not clean up until the field was reduced to 0.5 V/m, audio breakthrough being somewhat less marked. Although this set is not the worst, it would definitely be regarded as a troublesome one at 144 MHz.

Set C — A West German-made Set

Direct injection: Video immunity was good up to 21 MHz, but from 28 to 150 MHz it was fairly poor; however, no audio breakthrough was noted. Surprisingly, 432 MHz presented no problems at all, showing the set to have a good highpass filter in the front end.

Braid injection: Although this set was satisfactory at lower frequencies and on 14 MHz, there was a serious problem from 18 MHz upwards, fairly strong signals on 21 and 28 MHz, and only fairly strong signals on 50 and 70 MHz causing complete video muting. At slightly lower levels, the video turned on and off repeatedly. At 144 MHz the problem was much less severe but strong pick up levels could still cause a problem. At 432 MHz the problem was fairly marked again. One would need a very efficient braidbreaker to effect a cure for this strange phenomenon.

Mains injection: The video muting problem again occurred from breakthrough on the 28, 50 and 70 MHz bands, but it was absent on 144 MHz and 432 MHz. A good ferrite ring mains filter should cure the problem.

Field immunity: Immunity was excellent on the lower frequency and HF bands, and an extremely high field was required to cause video muting on 144 MHz, normal strong signals being coped with fairly well. It is curious that video muting usually occurred long before the picture was degraded to as poor as Grade 2, so it seem that this set is a go/no go one, and I suspect that an EMC component or two might have been omitted from UK market models.

Set D — Made in West Germany by an international company

Direct injection: Excellent immunity throughout the spectrum, including 432 MHz.

Braid injection: Immunity was good from 1.8 to 70 MHz on video, but audio breakthrough was noted on HF, becoming very serious at the top end of Band 2. PMR AM breakthrough could be very bad on this set. Video was poor and audio bad at 144 MHz, but there was absolutely no trouble at 432 MHz. I again suspect that some EMC component might have been omitted from sets marketed in the UK.

Mains injection: Although there were no video breakthrough problems, audio breakthrough was very bad from HF up to 100 MHz, 50 and 70 MHz being particularly vulnerable. 144 MHz was not serious, and no problems were noted at 432 MHz.

Field immunity: All lower frequency and HF bands were excellent except for 21 MHz, where audio breakthrough was noted above field strengths of 3 V/m. The set was extremely vulnerable to both video and audio breakthrough from 144 MHz, and the field had to be reduced to below 0.25 V/m to remove the breakthrough completely. Note that this borderline is some 22 dB worse than that for the Bang and Olufsen set, so woe betide PMR, as well as 144 MHz operators, if there is one of these sets close by!

Set E — Made in the UK by a Japanese company

Direct injection: Although this set had excellent immunity from 1.8 to 150 MHz, there was a bad problem at 432 MHz — a level on the inner of only 0.16 volts was sufficient to reject very strong signals, while both the old Post Office/DT FS72A and special six-section filters completely eradicated any problem.

Braid rejection: This set's immunity varied from quite poor to very bad between 7 and 144 MHz bands, both video and audio breakthrough being noted, the latter being particularly bad on the 28 MHz band. Slight audio breakthrough was also noted at 432 MHz. This set will need a very good braidbreaker or even a combination of two types to resolve serious problems.

Mains injection: Video immunity was generally good, other than on 28 MHz, where it was fairly poor. However, audio immunity was very poor generally, although no problems were experienced either for video or audio on 144 and 432 MHz. A good ferrite ring filter system on the mains lead near the set should be sufficient to remove any problem.

Field immunity: Video and audio immunity was very good on the lower frequency bands and on 14 MHz, but slight breakthrough from strong fields was noted on 21 and 28 MHz. Bad audio breakthrough was noted on 144 MHz, and the field had to be reduced to 0.4 V/m to clear it completely, although video breakthrough was not so severe, but still a problem. Set orientation dramatically changed the vulnerability rather more than usual. This set was considered fairly poor overall, but not the worst.

Set F — Made in the UK by a Japanese Company

Direct injection: This set gave an excellent performance in this test between 1.8 and 144 MHz, but serious problems occurred on 432 MHz. A Grade 5 picture was not obtained until the injection level was decreased to 0.1 volt, above this level, video blurring and colour blotching occurred with considerable severity above 0.5 volt, the audio muting completely at above 280 mV. Possibly an FS72A would remove the problem, but a six-section filter would probably be needed for the installation to be completely free of trouble from 432 MHz.

Braid injection: Immunity was excellent up to the 28 MHz band, and 50 MHz was fairly good, but on 70 MHz serious audio problems were encountered with high level injections. The onset of trouble was very sudden at around 1.25 volts, and at levels only slightly higher than this both video and audio completely went, and did not recover when the interference was withdrawn, the set having to be turned off for a while and turned on again to perform normally! Transformer-type braidbreakers near the set did not offer sufficient protection to overcome the problem completely when used on the antenna input, so there was clearly re-radiation from the feeder into the chassis. Results on 144 MHz were poor, and dependent on the coaxial cable positioning. No trouble was experienced from 432 MHz.

Mains injection: The set performed well right across the board, with only very minor problems showing up here and there with very high injection levels.

Field immunity: All bands tested from 1.8 to 28 MHz were very well rejected here, other than 21 MHz which was only a minor problem. At 144 MHz there was absolutely no audio breakthrough even at 6.5 V/m, but video breakthrough was bad, the field having to be reduced to only 0.3 V/m to eradicate any breakthrough completely.

Set G — Manufactured in the UK by a European Multinational Company

Direct injection: Immunity was excellent all the way from 1.8 to 150 MHz, but at 432 MHz immunity was very poor, and while an RBF1/70 might give adequate rejection a six-section filter would be advisable for rejecting very strong received signals.

Braid injection: Video immunity was very good up to 100 MHz, fairly good on 144 MHz, and excellent 432 MHz. However, audio breakthrough varied from very poor at HF to very bad at VHF. This set has a serious problem in the audio area, and strong fields picked up by the downlead braid from any VHF AM, SSB or CW transmissions could introduce marked audio breakthrough. Such transmitters could include police, fire and ambulance AM services, and even AM PMR. Radio amateurs could well be picked up as breakthrough when they were on the 28, 50, 70 and 144 MHz bands, the last three being particularly troublesome. Ferrite-ring braidbreakers might well help a lot, but it would also be worth trying in-line transformer braidbreakers.

Mains injection: Mains rejection was good on this set at all frequencies except 144 MHz, where it was just fair, but a simple ferrite ring filter should fix the problem.

Field immunity: Immunity was excellent on the lower frequency and HF bands, but audio breakthrough was a serious problem from high-level fields on 144 MHz, although video breakthrough was somewhat less serious. The field had to be reduced to only 0.26 V/m for the breakthrough to be completely insignificant. The main trouble with this set was breakthrough to the audio section, and it seems highly probable that components normally inserted in continental sets were omitted in the UK version to reduce manufacturing costs.

CONCLUSIONS

Although it may seem that I have given a lot of details on each of the sets I have to admit that I have only scratched the surface, since we actually noted nearly 200 measurements for each set, and I have had to leave out many laboratory notes for the sake of space. Even a quick perusal of the results for each set will show that the types of problem that may be encountered are usually very different between various models, but there are some broad conclusions which can be drawn. You are unlikely to have EMC problems directly attributable to antenna pick-up on the lower frequency bands, and most sets were surprisingly good at HF. Furthermore, even braid and mains lead pick-up of strong 1.8 MHz band signals is unlikely to occur. Braid pick-up in general is most likely to be a problem on lower frequency and HF bands, but some of the sets were very poor at 144 MHz. Mains breakthrough will probably not be encountered so frequently, especially if the television installation is on the ground floor. I am fairly certain that careful attention to the use of filters should give adequate protection to a television set, and please check back with Part 1 of this article for details of the use of filters. I am most concerned about direct chassis breakthrough, and here it is clearly VHF which causes the biggest problem, often to audio rather than video.

Inquiries made during 1986 have confirmed that many earlier sets designed or made on the Continent for Continental markets, sometimes have EMC components left out of sets made for the UK market because of the absence of satisfactory legislation. In Germany, legislation is very strict, and so there are far fewer EMC problems there. It is to be hoped that manufacturers will co-operate with the RSGB and many other bodies, so that models can be developed with far better immunity. Even the excellent Bang and Olufsen set would not quite meet the latest draft proposals as far as the lower VHF spectrum is concerned, and Bang and Olufsen most certainly took my comments seriously, and stated that they would strive further to improve their sets immunity.

It is to be hoped that a similar project might be undertaken one day on video recorders, because while the television set itself may be excellent, the video recorder may well be the weak link in the chain. The field is very wide, and I would like to see EMC reports on various models of telephones, hi-fi and radio and computer installations — the last including measurements of breakthrough transmitted as well as received.

ACKNOWLEDGMENTS

I would like to acknowledge not only the considerable help of individual members of the EMC Committee, but the assistance given by many engineers in the television industry, who were keen to see the testing carried out fairly and with approved techniques. In particular, I would like to thank Les Robotham G8KLH, for making the enormous cradle platform to hold the television sets around the house. Peter Tucker G4DWZ, and his wife Nikki, kindly let us use their house for many field trials. John Armstrong G8MVH, and his colleague Roger Wagstaffe, also gave much help, not only with the testing, but in making up at short notice, two well constructed, balanced, 144 MHz dipoles for use in the field tests.

ar

MORSEWORD© 15

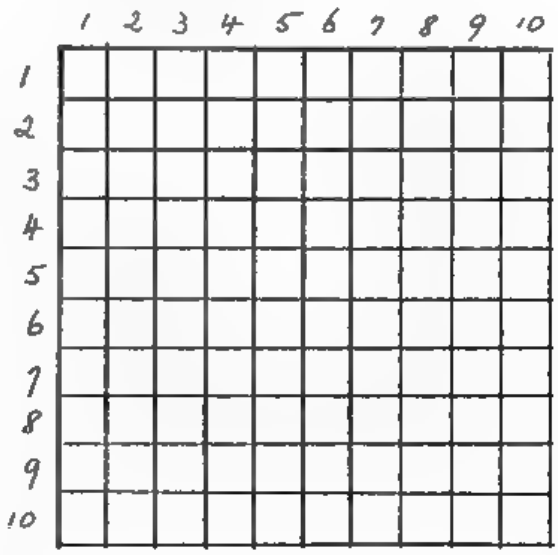
Compiled by Audrey Ryan

30 Starling Street, Montmorency, Vic. 3094

[redacted]

DOWN

1	Skin	1	Massage
2	Exits	2	Welsh girl's name
3	Inheritor	3	Dandy
4	Fibbed	4	Chief
5	Prevalent	5	Ear (colloq)
6	Examined	6	To have placed down
7	Girl's name	7	Cuddle
8	Aspirin (abbr)	8	Prescribed amount
9	The (Spanish)	9	Handle
10	Employs	10	Knocks



Solution see page 55 . . .

WICEN News

BUNGONIA CAVE RESCUE — Weekend March 12-13, 1988

Jill Rowling VK2DLY
42 Pemberton Street, Parramatta, NSW. 2150

The weekend following the second Tuesday in March is the Cave Rescue Exercise, organised annually by the Cave Rescue Group (part of VRA) in conjunction with the Police Rescue Squad, State Emergency Services, ambulance personnel, WICEN and others.

The object of the exercise is for the various groups to gain experience in rescuing injured people from difficult caves.

Bungonia is chosen because of its relative closeness to Sydney, and because it has "a bit of everything" to hamper a cave rescue: mud, foul air (CO_2 concentrations in certain areas), pitches (large holes), squeezes (tight spots), and mazes of twisting little passages, all different. The role of the WICEN operator is to relay messages between the cavers and headquarters using a controlled net.

Eight WICEN operators were present this time. Morton VK2DEX was co-ordinator for this exercise. Jeff VK2BYY was the "overworked" net controller. Jim VK2BZD, Alan VK2DPM, Peter VK2EMU, Jill VK2DLY, Noel VK2YXM and Alan VK2DQP.

The police rescue squad provided all the food and refreshments, plenty of 240 volts, lights, portable toilets and showers. Also the Saturday night's film.

Jeff brought the portable WICEN repeater (147.150 MHz) which performed admirably for the entire exercise and was set up atop a mast on a nearby hill.

Noel and Jill discovered that two-metres VHF works well, even inside caves to a certain extent (but it does depend on the cave!). Other operators found their equipment could not get out of deep dolines (roughly circular depressions in which caves are often found).

The following is a personal account of the exercise:

You are rudely awakened by a horrible alarm clock on the other side of the bedroom. You struggle out of a warm bed — it is 4.30 am, cold, dark and you now have to drive 190 kilometres. Maybe it would have been better to have left last night!

You leave Parramatta at 5.30 am and get lost at Marulan. Somehow you arrive at Bungonia by 6.10 am.

Other WICEN people are already up on a hill. Jeff VK2BYY is setting up a repeater. Morton VK2DEX and Jim VK2BZD, are passing traffic on simplex.

Morton delivers a briefing.

You go to your assigned Cave Rescue Group (CRG) leader and introduce yourself. Morning tea is served. (You have missed breakfast by arriving late!) You sit through informative and interesting lectures on caving equipment and safety.

Then the police serve lunch of sandwiches, fruit, tea/coffee/juice. After lunch it is time to rig up and join your assigned group. There are 16 CRG teams.

Today, you are looking after CRG teams Red 1 and Red 2 together because there are not enough WICEN operators and the two caves are close to each other.

Some groups go off to their caves in pickup trucks. You walk because it is not very far to your cave and it is a lovely day. You pass the general public camping ground and startle family groups who are enjoying family picnics.

Grace Matts, a member of CRG, shows Jill VK2DLY, the way to enter Cave B22 (acoustic pit).

(What's this? People wearing overalls, caving helmets, ropes etc, and some character in green overalls with a radio. . .).

You join the WICEN net officially, using appropriate call sign, eg: Red 1. Upon arrival at the cave, the Red 1 group are briefed then disappear underground through a small hole. You remain outside and wait for the Red 2 group to arrive.

Eventually they arrive (they had gone the wrong way) and the exercise begins. You are left sitting in the bush, on a rock in the dappled shade of a large tree, near a deep, dark hole in the ground. Birds are singing in one ear and the activities of the WICEN net in the other.

You become aware of a thumping and panting sound emanating from the hole. A breathless, grubby caver emerges and hands you a muddy note. "There's been an accident in the cave!" she pants. "Can you get help?" At this stage you double check to ensure it is a simulated accident and not a real one. Some cavers can put on quite an act. The note lists medical information about the "patient", plus whatever else is needed in the way of assistance. The message is copied onto a WICEN message form, prefixing certain words to indicate it is an exercise, together with the time and a serial number. There is a lot of traffic on the net and you have to wait until someone else has finished their message.

You inform the caver you will send the message as soon as you can get into the net.

There is a break on the net. "Control, this is Red 1."

Net control replies: "Red 1, control, send, over."

You send your message clearly and slowly with plenty of breaks to allow the control operator to write it all down.

You then tell the caver that you have passed the message on.

Meanwhile, the control operator (or his assistant) rings headquarters and repeats the message, and maybe receives a reply. Later you hear: "Red 1 from control". You acknowledge his call and write down the replied message. You give it to the caver, who then disappears underground.

There is a thumping from behind, bushes are parted and another caver appears from a different party – Red 2. This time it is a verbal message and you write it down as the caver remembers it. You verify the message with him, then follow a similar procedure to before but this time with a different call sign.

He requests a pretend ambulance.

"Control, this is Red 2!". Halfway through the message, your batteries go flat. "Stand by!" you tell control. You unclip the battery pack and plug in the second set. Control is taking another message from another group by this time. When they have finished you call. "Control, this is Red 2!" Control acknowledges, and says, "Repeat all after 'Green Ambulance'." (A green ambulance is a pretend one, for exercise purposes). You repeat the necessary message as requested. (This is another good reason why all messages should be written down).

After quite a number of messages have travelled back and forth, the "victim" eventually emerges, usually giggling or over-acting, assisted by fellow cavers.

There is a de-briefing, and refreshments are devoured. The groups then swap caves and the exercise is repeated again until dinner time.

You call for a pick-up truck (a real one, not a green one) to take the last weary group of cavers (and yourself) back to camp. Suddenly you are extremely popular. The truck arrives in no time. All clamber aboard and merrily return to camp. You resume your normal call sign.

Delicious smells pervade the camping area. The police have excelled themselves in the catering van. You untangle yourself from your equipment, grab some eating utensils and join the crocodile that has suddenly formed.

During dinner it gets colder and someone lights a bonfire which proves a godsend to everyone.

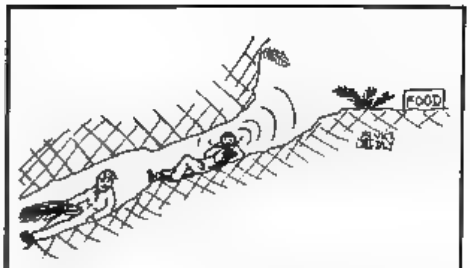
Later, the police set up their film projector and all thoroughly enjoy Police Academy 4. Halfway through the film a CRG leader calls for volunteers for the Yellow group which has still not returned! Everyone groans, and reluctantly members of the SES leave (or maybe they were volunteered by their squad leader?).

Morton VK2DEX is still out there and you feel a prick of conscience. The net controller is also still there but he had his dinner earlier. Eventually, after the film has finished, three pickup trucks arrive in succession, each with its share of cold and tired (but elated) cavers — and there is Morton! The police serve up another set of dinners! Everyone stands around the bonfire and swaps outrageous stories until well into the night. Many new friends are made.

Eventually, everyone retires for the night. What a day!

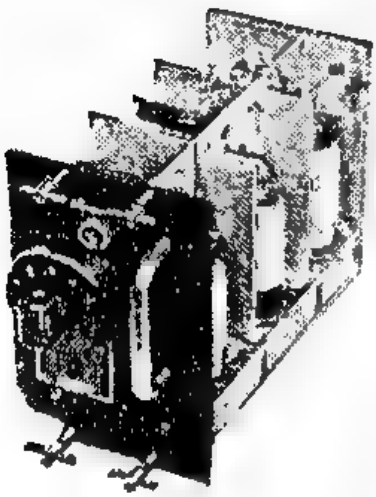
There were two real caving accidents that weekend, thankfully both were minor. (One caver fell four metres and gashed his leg whilst the other suffered hyperventilation after demonstrating what hyperventilation was!).

These mishaps were passed through the WICEN net. WICEN were later congratulated on the speed and efficiency of their message handling, because it was all over and sorted-out before the other cave groups knew anything about it.



Jill and another member of CRG outside Cave B50.

A R Showcase



UNITED KINGDOM DISPOSALS

(excludes US equipment)

This booklet consists of a listing of over 300 items of disposal radio and associated equipment advertised in the United Kingdom during the years 1945 to 1960.

The original advertisements are featured, with the equipment type being listed numerically where possible.

This booklet is a valuable reference for new, as well as established collectors, for nostalgic buffs and for those who used the equipment.

The project of compiling the booklet came about following complete frustration of not having any extensive reference of equipment of UK origin. The obvious source, magazine advertisements, was available but retrieval was not so easy!

To make the listing more interesting, the original prices have been included. Quite some mouth watering bargains!

Equipment from the 1945 to 1960s era is beginning to resurface. Perhaps you have an item you wish to identify — here is a useful source.

The booklet is available from the author for $6 per copy. Also the NSW Division is holding limited stocks.

For further information contact the author, Ian O'Toole VK2ZIO, 222 Old Northern Road, Castle Hill, NSW. 2154 or telephone (02) 680 2112.

TELEX RADIO

Using modern technology and a specially designed modem for the land mobile radio channels, *Dataradio* have released the "Telex Radio".

Telex networks of up to 256 can be set up using Telex Radio. For over-the-horizon applications, store and forward digital repeaters are used to keep data integrity. Multiplexers are available to connect many terminals into one communications line. It is possible to mix data with telex in the same network allowing computer communications to occur with Telex traffic.

Applications will include ship-ship, ship-to-shore, remote location networks and mixing of Telex traffic on the normal land mobile voice channels.

For further information contact the Australian distributor: Mastatek Pty Ltd, Suite 1, 245 Springvale Road, Glen Waverley, Vic. 3150. Telephone (03) 233 6677 (Vic) or (02) 477 6120 (NSW).

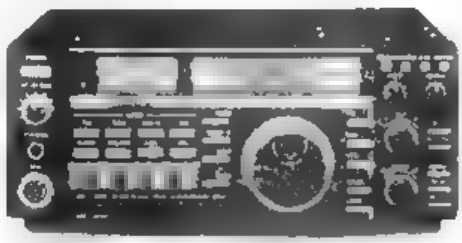
CL-20 RADIO MODEM FOR 9600 bps ON MOBILE RADIO CHANNEL

The FM Land Mobile Radio Channel can provide an economic data channel for data communications. The new CL-20 modem, designed by Dataradio (Canada) provides a 10 dB sensitivity increase over their widely used CL-10 model. In addition, it will be possible to use the modem with existing two-way radio's and provide a network speed of 9600 bps. Modem lock time is only a few milliseconds making it ideal for packet radio applications.

Store and forward repeaters are used to allow transmission over-the-horizon. Other options include five port multiplexer, 32 bit digital identification for SCADA applications and intelligence for networking. The CL-20 is ideal for mobile applications where high throughput is important.

Dataradio is manufactured to stringent commercial requirements with a design MTBF of some 25 000 hours.

For further information contact the Australian distributor: Mastatek Pty Ltd, Suite 1, 245 Springvale Road, Glen Waverley, Vic. 3150. Telephone (03) 233 6677 (Vic) or (02) 477 6120 (NSW).



ICOM IC-575A

With the release of the Icom IC-575A, a 10 metre and 6 metre dual band companion to the IC-275A two metre and IC-475A 70 centimetre all-mode transceivers, the circle is complete.

All the features of the IC-275A, the two metre all-mode base/mobile transceiver which has become the benchmark for transceivers above 30 MHz, are now available on 70 centimetres, 6 and 10 metres.

The IC-575A is an SSB/CW/FM dual band transceiver capable of continuous reception from 26 to 56 MHz and transmitting between 28-29.7 and 50-54 MHz, with a built-in 240 volt AC 100 percent duty cycle power supply and 13.8 volts DC mobile operation.

It features the unique Icom Direct Digital Synthesis (DDS) frequency generation circuitry, the modern successor to phase-locked-loop (PLL), completely replacing all PLL circuitry with an advanced, computer designed digital synthesis circuit for extremely fast (5 mS) lock-up, fast switching for advanced digital modes, a superb frequency stability through the mixing of DDS-generated source frequencies in an advanced double-PLL system.

Inside the IC-575A is the same advanced HD64B180 ROP central processor unit as is found in the IC-275A and 475A, providing 99 user-programmable memories plus two priority channels, each storing frequency, mode, duplex offset and direction, and sub-audible tone data (where used).

The advanced microprocessor inside the IC-575A also provides equally advanced remote control capabilities using Icom's unique Computer Interface-V (CI-V) standard, connecting via a rear panel connector to any standard RS-232C serial port.

Four independent scan modes provide easy and convenient monitoring of the six and 10 metre bands. Programmed Scan-mode repeatedly scans a selected portion of either band between two user-defined limits (stored in memories 1 and 2) with selectable stop-on-busy or stop-on-clear. Mode-Selective Memory Scan monitors only those memories programmed in the same mode as the main display. Skip Scan allows temporary avoidance of unwanted memory channels.

A high-integrity liquid crystal display (LCD) with soft orange illumination provides maximum visibility, even in bright sunlight. The display unit of IC-575A constantly monitors the VFOP in use, the selected mode, frequency split or duplex offset, scan mode, current memory channel, RIT offset, sub-audible tone (if used) and operating frequency.

Receiver sensitivity is claimed at less than 0.13 uV for 10 dB S/N (SSB/CW), while selectivity is claimed at 2.3 kHz for -6 dB.

Transmitter power is continuously adjustable from 1 to 10 watts (1-4 watts AM) for the front panel. Spurious outputs are suppressed by more than 60 dB, while carrier and unwanted sideband in SSB mode are reduced by more than 40 dB (1000 Hz AF tone input).

Other features include IF passband tuning, deep notch filter, noise blanker, selectable AGC, speech compression plus many optional enhancements.

A rear panel AFSK jack provides easy access for advanced mode operation and the unit is equipped with a Data switch to reduce PTT switching time for fast-switching applications like packet and AMTOR.

The Icom IC-575A is available for inspection now at your nearest authorised Icom dealer. For details of your nearest dealer, contact Icom Australia, 7 Duke Street, Windsor, Vic. 3181 or phone toll-free on (008) 33 8915.

QSP

IC CARDS HERE

Westpac Bank has begun a trial use of Smartcard technology and other banks, including the Commonwealth, ANZ and National Australia, are looking into the use of the cards.

Invented in France 14 years ago, the Smartcard includes an integrated circuit (IC) and has a wide range of uses.

The cards provide a self-confirmation of ownership and authority without having to access on-line computer networks as is the case with conventional plastic cards.

SUPER-CONDUCTOR RACE

Research continues into superconductivity with IBM discovering a ceramic compound it claims offers no electrical resistance at minus 148 degrees Celsius.

Superconductors are being developed to improve devices that use electricity, but so far none has been found that can be used at warm enough temperatures to have widespread use.

IBM is keeping the formula of the new superconductor secret but its operating temperature is roughly 20 degrees warmer than the previous record.

Scientists are trying to make materials that become superconducting at as high a temperature as possible, to make them practical for uses in high-speed computers, bullet trains and other applications.

Club Corner

LAND FORCES AMATEUR RADIO GROUP

The Second Annual General Meeting of the Land Forces Amateur Radio Group was held on 3.590 MHz, at 8.30 pm on March 16, 1988. There were 10 members present

Office bearers for the following year are

President — Murray VK3DOV
Vice-President — Vic VK3CQP
Secretary — Sam VK2APK
Treasurer — Bob VK7NBF
Committee — Joe VK3AXM and Alan VK2ELE

The Group meets each Wednesday evening on 3.590 MHz ±QRM at 1000 UTC. Membership is available to any amateur or SWL from any Armed Service. Details are available on the net or by contacting the Secretary, QTHR

—Contributed by Murray Bloomfield VK3DOV, President, LFARG

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BARCFEST 88

The Brisbane Amateur Radio Club will be conducting it's Sixth Annual Barcfest (Hamfest) on Saturday, May 7 1988.

The venue is the same as previous years, ie the Indooroopilly State High School Assembly Hall, Ward Street, Indooroopilly.

Features include displays by retailers, specialised amateur groups, antique radio collectors and the WIA Queensland Division Bookshop. Lectures will be held and there will also be some Art and Craft displays for the ladies.

A large amount of disposals equipment is expected to be available for sale. Anyone wishing to dispose of surplus equipment is invited to do so. No fee or commission is charged for such sales.

Refreshments will be available in the hall.

—Contributed by David Prince VK4KDP, President, BARC

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GOLDFEST 88

Once again the Gympie Amateur Radio Club is holding an amateur get-together at the Chatsworth Hall/Chatsworth School venue, just a few minutes out on the northern outskirts of Gympie City.

Why 'Goldfest'? Gympie grew on gold, turned to other means of livelihood and is now again, with the aid of BHP, mining from as deep as 900 metres. "Goldfest 88" will usher in the annual "Gold Rush" festivities and will offer something a little different from the 'big city' style of Hamfest.

Come and sample clean air, country hospitality, fellowship, and cooking and win a Gold Award.

Keep Saturday, October 8, 1988 free so you may attend this event. Commencing time 9 am.

—Contributed by Alan Gardner VK4BWG, Secretary, GARC Inc

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DISABLED RADIO AMATEURS' CLUB

General meetings are held on the first Saturday of each month (unless otherwise indicated) and commence at 2 pm.

Dates for the rest of this year are as follows:

May 7; June 4; July 2; August 6; September 3; October 1, November 5; December 3 (this is the Christmas break-up and begins at 12 noon).

Dates may alter according to public holidays.

Other club functions are held every other Saturday afternoon between 2 pm and 5 pm and each Thursday evening after 7.30 pm.

If members wish to use club facilities at other times approval must be gained beforehand. NOTE: Transmitting equipment must only be used under the supervision of respective licenced operator.

Field Days and Social Activities are arranged from time to time as suggested at meetings.

Annual membership is due in May and is currently $5.

To alleviate phone calls and postage it is appropriate to keep in touch by being present at meetings and making contact with fellow mem-

Club call sign is VK3ZZ.

The club has a saying: *You QSO with us and we'll QSL with you!*

—Contributed by Kelvin Lee, Honorary Secretary, DRAC

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GEELONG AMATEUR RADIO CLUB ANNIVERSARY

This year, as Australia celebrates its bicentenary, radio amateurs in Geelong have further cause to celebrate. This year 1988, marks the 40th anniversary of the Geelong Amateur Radio Club.

The inaugural meeting of the club was held at the studies of radio station 3GL, in James Street, Geelong, just three years after the end of WWII. Among those present were

Alec Bell VK3ABE, Alf Forster VK3AJF, Arch Woolnough VK3BW, Bill Barrott VK3WT, Ed Kosseck VK3AKE, Fred Freeman VK3ALG, Bill Brownbill VK3BU, Harry Selman VK3CM, Bob Wookey VK3IC, and Jack Matthews VK3SY. Unfortunately, incomplete records do not allow us to be certain of the details surrounding the club's formative years and much of the early history has been lost in the mists of t me.

Notable in the list of founding members are Bill Brownbill VK3BU, believed to be the first amateur to hear signals from Sputnik 1, Ed Kosseck VK3AKE, who was the first to span Bass Strait on two metres and, of course, Alec Bell VK3ABE (SK), the founding president. Perhaps even more notable is Alf Forster VK3AJF, who is currently serving his second consecutive term as president.

For some years the fledging club met at the premises of the Geelong Budgerigar Club, eventually moving on to various premises around Geelong. Today the club occupies its own clubrooms, which was built by members in the early 70s, in Storrer Street, East Geelong.

During its 40 years the club has achieved much to be proud of. In the late 60s it installed one of the first two-metre FM repeaters (the forerunner of what is now the Mount Anakie repeater, VK3RGL). It currently operates two two-metre repeaters, VK3RGL and VK3RGC, a UHF CB repeater and a six-metre beacon, VK3RGG. The club has also constructed its own brick building on Mount Anakie and is developing the site as a first-class facility to serve the local amateur community.

Among the projects nearing completion are a 70-centimetre repeater, two-metre beacon and the club's amateur television station, due to be operational by the end of March.

To mark the occasion, the club will celebrate its 40th anniversary at a dinner on June 18, 1988. It is expected that more than 150 people will attend.

—Contributed by C Ghaccarini VK3BRZ

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Q R M from VK7

John Rogers VK7JK
VK7 BROADCAST OFFICER
1 Darville Court, Blackman's Bay, Hobart, Tas. 7052

The first three months of 1988 proved to be an extraordinarily busy time for WIA Branch members in Tasmania. Apart from the usual meetings each month, there were the Annual General Meetings plus Divisional Meetings.

We were then faced with the special meetings to discuss the devolvement of the AOCP examinations. The Divisional Broadcast service expanded to include an updated repeat of the Sunday morning news bulletin, broadcast on Tuesday evenings at 1930 hours, 80 metres only, preceding the long-running Devil Net on 3.590 MHz. This was mentioned earlier in the year as a possibility and is now an established fact.

The number of operators involved in the compilation and transmission of the VK7WI Broadcast is now 30 — a very encouraging sign! The Federal Tape is not the only tape-insert either — interviews have been carried out with visitors/amateurs from Canada and America. These have proved very popular.

The next step — a few minutes on air to put forward your own particular point of view?

Noel VK7EG, who recently publicised a scheme to assist would-be radio amateurs, must have felt things were really going his way when the subject of devolvement of AOCP examinations by the DOTC was discussed in Launceston. Certainly it must mean greater participation by the WIA, not only in running courses, but in setting up the actual examinations! At a subsequent meeting of the Southern Branch, the point was made, very strongly, that unless the WIA became the focal point of all the amateur training and testing, it would forgo any claim it might have had to being the leading organisation for radio amateurs in Australia. We must be at the forefront of all bodies moving to replace the DOTC in the examination fi[illegible]

Everyone concerned with amateur radio expects the WIA to take the lead, and we would lose all creditability if we remained apathetically on the fringes of this, to us, new field.

TASMANIAN MEETINGS FOR MAY

SOUTHERN BRANCH: at the Activity Centre, 105 Newtown Road, Hobart, at 8.15 pm on Wednesday, May 4.

NORTHWESTERN BRANCH: at Penguin High School, 7.30 pm sharp, on Tuesday, May 10.

NORTHERN BRANCH: at Launceston Maritime College, at 8 pm, on Friday, May 13.

Bob VK7NBF, wishes it be known that, if you are thinking about tackling the Tassie Devil Award, don't be put off at the idea of sending out batches of QSL cards. QSL cards are not necessary for the award. So, go to it, and start on the Devil trail. You may be emulating YB0XX who, by this time, should have the appropriate number of VK7s to attain the award.

Lew VK7LJ, is very proud of his AMTOR equipment and is always on the lookout for contacts, especially since he recently accepted the challenge of originating a VK7WI broadcast — the more news he gets, the easier the broadcast becomes.

With the onset of the colder weather, many of our amateur friends will be braving the warmer climes of VK4-land. With this in mind, our 20 metre relay of the 0930 hours, Sunday VK7WI, will be recommencing soon. Listen for details before you set off on that holiday jaunt, and keep in touch with what is happening at home. Even let us know of your travels!

73 from John VK7JK

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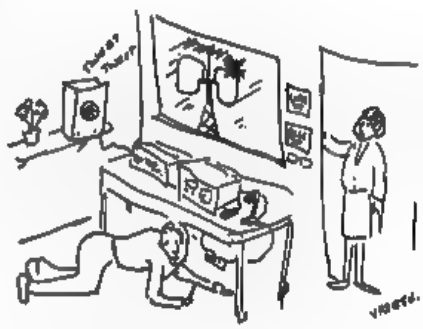
INTERNATIONAL TRAVEL HOST EXCHANGE

Ash Nallawalla ZL4LM/VK3CIT
Federal Co-ordinator of the International Travel Host Exchange
PO Box 539, Werribee, Vic. 3030

I am pleased to see the steady flow of new members in the ITHE program. At the time of writing participants are VKs: 2BSR, 2CWS, 2CXX, 2DXP, 2SU, 2NET, 2SW, 2YXM, 3CE, 3CIT, 3PZA, 3OM, 3QQ, 4AKU, 4CWB, 5NOT, 5QJ, 6LT, 7HK and 8AV. We now have members in almost all call areas (how about it, VK1s and VK9-0? ! ?). We have been able to help VK and overseas participants to make contact with amateurs at their destination, but remember that your name need not be on the list in order to gain the same benefits. Please send me a SASE if you want such help.

Some participants put additional information on their registration forms or in amplifying letters. The ITHE scheme is administered by the ARRL and we have to abide by their set format, therefore individual variations are difficult to incorporate.

Please give the ITHE another thought!



Of course I am sure the problems underneath . . .

—VK3BTU

VK3 WIA Notes

WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following applications were received for the month of February 1988 and were accepted by council on February 25, 1988. A warm welcome is extended to all.

Peter Broughan VK3PJB	Traralgon
Kelvin Date VK3TBZ	Box Hill North
Steven Fuller VK3MAS	West Preston
Kenneth Fuhrmeister VK3MBD	Watsonia
Leonard Harper	North Balwyn
Colin Howie VK3ZXT	Monbulk
Stephen Hunter	Shepparton
Andrew Kurtze	Mount Eliza
Jonathan Lipton	North Balwyn
Peter Morrison	Boolarra South
Sean Neyton VK3SN	Maidstone
Max Oppy	Mount Waverley
Glenn Sampson VK3KSG	Bayswater
Robert Sibson VK3JBC	Kaniva
Bruce Sparks VK3TCM	South Mildura
Owen Twist VK3DZN	Vermont South
John Waters VK3PXJ	Tatura

THANKS

The WIA (Victorian Division) would like to express its thanks to the following for their donation of QSL cards towards the WIA collection:

Bill VK3AD, Eric VK3KF, Fred VK3ARK, Ray VK3JI, Tom VK4OD, Frank VK3FC, Percy VK2EPW (courtesy Kelvyn VK4VIM), Mrs Margot Tomich, daughter of the late George Turner VK3GN, Mrs Miriam Gilder, widow of Don VK3AHG, Bill VK4BIL, for QSLs of Silent Key John VK4ASP, Keith VK3SS for QSLs of Silent Key Jock VK3DOJ.

The WIA has also received QSL cards from Bob W5KNE in Texas and Jim WDJRN in Colorado.

There have been some very generous donations of QSLs towards the collection but it is a little disappointing that a few of our best DXers (both present and past) have not offered to help. We depend upon such successful DXers to make the collection a first-rate one.

—Ken Matchett VK3TL, Honorary Curator

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Solution to Morseword© 15

Across: 1 peel 2 gates 3 heir 4 lied 5 rife 6 tested 7 Nora 8 APC 9 ios 10 uses.

Down: 1 rub 2 Megan 3 beau 4 head 5 fug 6 fain 7 hug 8 dose 9 feel 10 hit

	1	2	3	4	5	6	7	8	9	10
1	•	—	—	•	•	•	•	—	•	•
2	—	—	•	•	—	—	•	•	•	•
3	•	•	•	•	•	•	•	•	—	•
4	•	—	•	•	•	•	•	—	•	•
5	•	—	•	•	•	•	•	—	•	•
6	—	•	•	•	•	—	•	—	•	•
7	—	•	—	—	—	•	—	•	•	—
8	•	—	•	—	—	•	—	•	—	•
9	•	—	•	•	—	—	—	•	•	•
10	•	•	—	•	•	•	•	•	•	•

VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

NEW COUNCIL

By the time these notes appear the AGM will have been held and the new council in office. As these notes were being prepared during March, it appeared that there would be sufficient nominations to form a new council but not enough to require an election.

Full details will be given on the AX2WI broadcasts. The morning session commences with the technical tape at 10.45 am followed by the news at 11 am. The evening has the tape at 7.15 pm and the news at 7.30 pm. If the times are such that you are unable to listen, catch up with the news headlines by telephoning (02) 651 1489. Most of the news items in the broadcast, other than those on tape or by direct submission, may also be obtained on the VK2AWI packet bulletin board on channel 4850 in Sydney or the networks on 7575.

VI88NSW

Groups registered (as of March) for operation during May are the Orana Region ARC on May 2 to 8, and Castle Hill RSL RC May 9 to 15. The week from May 30 to June 5 is available to any amateur in a series of three hour time slots. If you have not, or will not get a chance to operate in one of the club weeks, then you may assist the Division to keep the call sign activated. Further details may be obtained by contacting the Divisional Office, via the postal address above, or telephone (02) 689 2417 weekdays between 11 am and 2 pm or on Wednesday evenings from 7 to 9 pm.

BLANK QSL CARDS

A new range of cards were added this year as part of the Bicentenary. You only need to overprint or use a rubber stamp. The is a range of colours. Cost is $6 per 100 plus package and postage. Check with the office for stock and all-up cost. The VK2 Division has been appointed by the Bicentenary Authority to act as their agent to check designs for QSL cards and awards if you wish to use references to the Bicentenary. This service is available to Institute members from any Division in Australia. Further information from the Divisional Office or just send the design along. We will do the rest for you. It is normally about a two week turn-around on approval.

NEW MEMBERS

A warm welcome is extended to the following who became members at the March intake:

J G Garland VK2XJG	Tingira Heights
D W James VK2DOR	Wagga Wagga
C I Parry Assoc	Gorokan
C Small Assoc	Loftus
K J Smith VK2UH	Taralga
A Solomon VK2NVS	Randwick
R A Stephenson VK2PZZ	Naremburn
B M Tunnicliffe VK2EBT	Bayview
R G Turner VK2DWA	Horsley Park
J F Watson Assoc	Stokers Siding
A Willys VK2FLY	Blayney
G Worraker Assoc	Westmead
Z Zurynski VK2XJL	North Parramatta

EVENTS IN THE NEXT FEW WEEKS

May 17	ITU Day. Operation of the special AX(VI)2ITU station by the Division. Similar special stations will operate in most of the other Australian call areas. QSL card available.
May 22	Postcode Contest — two metres SSB from 9 to 11 pm. (See Contest Column). Logs to PO Box 1066, Parramatta NSW 2150 by June 11.
May 29	Trash and Treasure Sale at 2 pm (Sunday) in the Amateur Radio House car park at Parramatta.
June 4	Annual Fireworks Evening at VK2WI Dural. Details on broadcasts.
June 11/12	Annual Field Day of the Oxley Region ARC at Port Macquarie. Details from their Secretary at PO Box 712, Port Macquarie NSW 2444.

Five-Eighth Wave

Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA 5039

Just a few short notes at this juncture, as most of the column will be taken up with the President's Report to the AGM (April 26, 1988).

Firstly, my grateful thanks to Peggy Muxlow, the wife of Cyril VK5KEM, who has agreed to do the buying and organising for the Clubs' Convention (and to Cyril who will, no doubt, be involved also). Thanks also to Pam Bruce, Gill Wardrop, Lorraine Maddern and Brenda Malabone who have offered to cook, or help at the Convention, or both! (By the time you are reading this of course, it will be past tense).

Also, I am delighted to say that I think we have someone willing to take over this column. I will not name him just yet, in case it does not eventuate, but I certainly think he would be very good at it. Don't forget though, that having something to write depends a great deal on being fed information, and that is something that you can all help with.

DIARY DATES

Tuesday, May 24 — Ray Dobson VK5DI on "Thick Film Hybrids" 7.45 pm.

Tuesday, May 31 — Buy and Sell night 7.30 pm (no ESC etc).

PRESIDENT'S REPORT TO THE ANNUAL GENERAL MEETING OF THE VK5 DIVISION — April 26, 1988

The past year seem to have been one of "winding down" and "gearing up". The first half seemed to be spent getting out breath back after the hectic activity of the Jubilee Year and now we are beginning to get active again for the Bicentenary. Australia Day saw the VI88SA call sign get a huge "christening" with over 1000 contacts being made, it will be heard again when the First Fleet sails in to Port Adelaide (we hope to have a station down there for eight days) and later in the year from the *Murray River Princess* and the Grand Prix. The VI88SA and VI88NT call signs will also be used by various affiliated clubs throughout the year. A group using the call sign AX5WIA, worked EI1000 and several other "Dublins" around the world, to help Dublin, Eire, celebrate its Millennium (1000 years). The initial contacts were made on March 17 (Saint Patrick's Day) but they will try again on July 10, which we believe was when Dublin received its Charter. Bicentenary cards are available for both clubs and groups using the VI88SA/NT call signs and for individuals to use with their own call sign.

This year the subject of the Devolvement of Examinations and the question of Novices being granted permission to use two-metres (or some other common band) created a great deal of discussion. The examination question was discussed with speakers from DOTC Canberra at our February meeting and will no doubt be the subject of much more discussion before it takes effect in 1989. The 'common band' question forced up to send out a questionnaire to all members in this Division but unfortunately, even then, we did not get any clear-cut answers. Giving the member more for his/her money (or conversely giving the non-member less) has been one of our aims this year. As from next year, non-members will not be able to send cards overseas or interstate through the QSL bureau, although they will be able to receive cards coming from overseas, etc. The printing of membership cards, which might gain you discount at certain retail outlets, is also being looked at. Bankcard facilities is another service which might make things easier for members.

During the year the Council played host to a couple of members of Thebarton Council, who were interested in finding out what we did. As a result of this we almost got a mention on the Lionel William's television show, but in the end only the BGB rated a mention! Also, during the year we hosted afternoon tea for a group of ALARA members and their OMs who were attending the National Get-Together in Adelaide. In the presence of Council members and other VK5s, ALARA President, Marilyn VK3DMS, presented the Florence McKenzie Trophy, which this Division has agreed to house for ALARA. We were very pleased that Sir Mark Oliphant agreed to accept Honorary Life Membership of this Division. Although not an amateur himself, Sir Mark has had connections with amateur radio dating back to the earliest experiments conducted by Professor Rutherford.

At the last AGM, Alan Mallabone VK5NNM and Hans Van. Der Zalm VK5KHZ, were elected to Council. Alan became Education Officer and Assistant Membership Secretary and Hans was the Clubs' and Country Members' Representative. John Anderson VK5ZFO became Program Organiser from May until November and we had some very interesting speakers. David Clegg VK5AMK, was forced to relinquish ESC due to other commitments, and we were pleased that Ian Badson VK5ZBI, was able to take over from David. We were also sorry to accept the resignations of Ray Bennett VK5RM, as our Historian, but Ray subsequently agreed to stay on for a while and now John Hampel VK5SJ, has agreed to take over in a few months time. We have not lost the many talents of Bill Wardrop VK5AWM, nor of Graham Iles VK5AT. Bill has agreed to stay on as Treasurer of the Division, but has relinquished the position of WICEN Director to Graham. This means that we shall need a new Auditor to replace Graham.

Amongst the many technical projects with which we have been involved (a belt only slightly, for the most part) perhaps the one that has "dragged us towards the 21st century" the fastest, has been the Packet Radio Bulletin Board which is now housed in the BGB. The other spin-off from this has been the formation of SAPUG (South Australian Packet Users' Group) which we are pleased to welcome as another affiliated club.

Needless to say, there is not enough time or space to mention all the activities, nor all the people that have been involved in making them happen, during the year but if you did anything that helped this Division, benefitted your fellow amateur or advanced amateur radio in any way, we thank you.

On a personal note, I would like to thank the members of Council who have been so supportive and given me a great deal of encouragement over the past two years. It has been a great honour and privilege to have been the first lady President of this Division.

Jennifer Warrington VK5ANW

VK4 WIA Notes

David Jones VK4NLV
18 Browning Court, Strathpine, Qld 4500

Due to the lead time required for AR these notes are being prepared prior to the two most important events on the WIAQ Calendar, those being the Radio Club Conference followed by the Federal Convention.

Why do we place such emphasis on these events?

It is unfortunate that, despite the high level of sophistication we have achieved technically, we still have a basic communication problem. In some other Divisions, it is almost an offence to discuss the politics of amateur radio in an open-air manner, and this breeds ignorance. An unhealthy ignorance of the problems of other amateurs.

In VK4, this problem of ignorance has been largely overcome by our Radio Club Conference, where all our local problems and future thoughts are ironed out, so that Queensland amateurs at least understand each other. For a Division as decentralised as ours, this achievement is no mean feat. It requires a healthy percentage of our annual income just to find out what we are all thinking — not to mention the logistics of putting together a Conference of over 80 persons in a live-in format for two days.

This year, the CQ Branch has been responsible for a substantial part of the organising of the Conference and was the host for the 1988 Conference held at Yeppoon, in Central Queensland. Congratulations and thanks, CQ Branch. This is yet another example of your Council's commitment to hearing the voice of the "grass roots" amateur. This year also saw a delegate from the monthly general meeting attend to represent those not represented by clubs, and it was also attended by individuals, as distinct from official club delegations. Our official guests included Terry ZL3QL, President of NZART, and in the past, has usually included representation by DOTC — indeed the sophisticated equipment made available to Doug VK4ADC, in his capacity as DOTC representative in 1985 is reflective of the Department's ongoing interest in our affairs.

So why do we do it? So that your Divisional Council is aware of your thoughts and needs, and can give adequate instruction to your Federal Representatives on your thoughts regarding issues of a more national interest, and, indeed, our future as a radio service.

Can I help? Please. By advising your club of your thoughts, or if you are not a club member, then by calling in to the Queensland Net on 3.605 MHz ± QRM, on Thursdays at 2000 UTC, or by writing to us at GPO Box 638, Brisbane, Qld. 4001.

This year sees six Old Timers on Council, and welcomes Jack VK4AGY, Don VK4KDT, Claude VK4UX, Jim VK4ZML and Bill VK4MWZ. It is a Council full of experience and will be very responsive to your needs — if we know them!

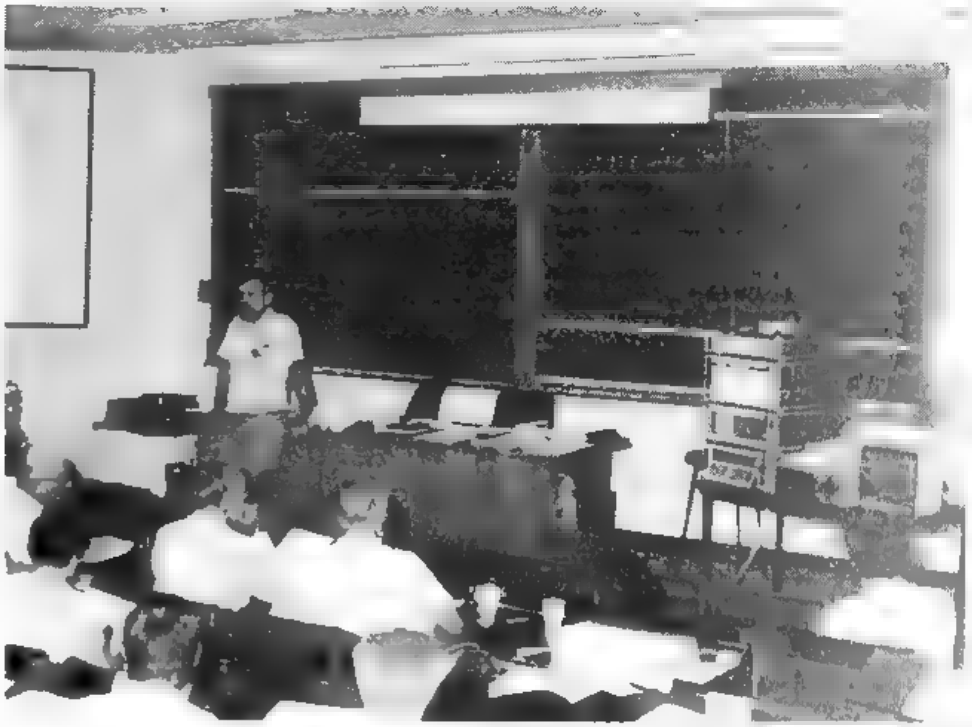
So, why do we place such emphasis on these conferences and communications services? Because we care!

EXPO 88

At the time of writing, it would appear that there has been no change in the status quo. Your Council is attempting to get the call sign to air, and if you hear AX4XPO, you will know we have met with limited success. More (maybe) later.

RD CONTEST 1987

Congratulations to all the amateurs who participated in last year's contest — two years running is quite an achievement for VK4. Unfortunately, the weighting factor will now start to work against us, so we will need an even better effort this year if we are to retain the Trophy (see photograph VK4 Notes, AR March 1988).

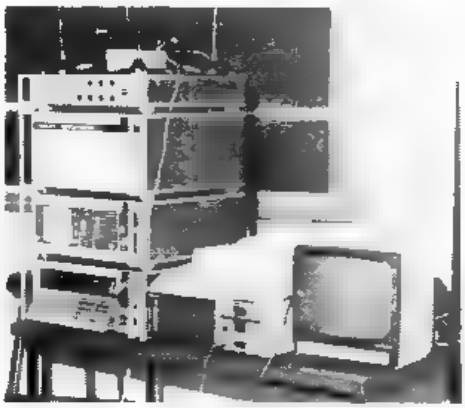


Doug VK4ADC, at the 1985 RCC. Doug was the DOTC representative and gave a lecture on new tracking equipment. The lecture was so good we were late for dinner!

WIAQ COUNCIL FOR 1988

The following Council members were elected on March 9, 1988.

President	David Jones VK4NLV
Senior Vice-President WICEN Liaison Officer	Harry Standfast VK4ASF
Junior Vice-President	Murray Kelly VK4AOK
Honorary Secretary Ex-Officio Member	John Aarsse VK4QA
Assistant Secretary Alternate Federal Councillor	David Jerome VK4YAN
Honorary Treasurer	Ross Mutzelburg VK4IY
Club Liaison Officer	Claude Singleton VK4UX
QSL Liaison WIAQ Liaison	Bill Dalgleish VK4UB
Service Liaison Officer Editor QST	Jim Smart VK4ZML
Research Officer	Bill Horner VK4MWZ
Disposals Officer	Don Thomson VK4YI
Federal Councillor Ex Officio Member	Guy Minter VK4ZXZ



Equipment displayed by DOTC at the 1985 RCC.

WIAQ OFFICERS 1988

The following Officers were appointed on March 9.

Federal Councillor	Guy Minter VK4ZXZ
Alternate Federal Councillor Council Member	David Jerome VK4YAN
Membership Secretary	Madge Dalgleish
Manager VK4WIA Council Member	Jack Gayton VK4AGY
Manager VK4AWI Council Member	Claude Singleton VK4UX
Manager WIAQ Bookshop	Anne Minter VK4ANN
News and Information	Bonney Pounsett Bud Pounsett VK4QY
WICEN State Co-Ordinator	Ken Ayres VK4KD
Manager Qld Awards	John Moulder VK4YX
Manager Qld Contests	Joe Ackerman VK4A X
Manager QSL In/Out Council Member	Bill Dalgleish VK4UB
Manager VK4 IARUMS	Gordon Loveday VK4KAL
QTAC Chairman	Paul Hayden VK4ZBV
QTAC Secretary	Guy Minter VK4ZXZ
QTAC Committee Member	Brian Rickaby VK4RX
WIAQ Meeting Convenor	Laurie Blagbrough VK4ZGL
WIAQ Historian	Allan Shawsmith VK4SS
WIAQ Education Co-Ordinator	Ron Smith VK4AGS
Minute Secretary Council	John Aarsse VK4QA

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Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

Over to You!

MULTI-CHOICE EXAMINATION QUESTIONS

Following the decision of the Department of Transport and Communications to hand over the examining of candidates for Radio Amateur Certificates to others, it is probable that some of the new examiners will write their own questions. Well written questions of the multi-choice type are not easily produced. However, a skilled examiner can write a paper that defies the efforts of the "guessers" to obtain a pass. It is reasonable to set the pass mark at 70 percent since a candidate with no knowledge of the subject can produce about 20 percent of right answers.

Although I do not claim to know all I should about writing this kind of question, I have had some experience and have fallen into some of the traps. So, here I set down some comments based mainly on questions I have come across recently. You may not agree with all; you may have some comments of your own to add to them. This should all contribute to a better standard of examination paper in the future.

1. The "stem" of the question and the response should form a statement. For example:
"Two 100 ohm resistors in parallel will have a total resistance of: 50 ohms."
rather than
"What is the total resistance of two 100 ohm resistors in parallel?"

2. Numerical answers should be arranged in ascending (or descending) order rather than random order.

3. Avoid negative questions. For example:
"The frequency bands on which the holder of a Novice Licence is permitted to operate are."
[illegible]
"Which of the following frequency bands may not be used by holders of a Novice Licence?"

4. Avoid long questions. Frequently a circuit diagram can be used to good effect. Sometimes several questions can be asked from the one diagram.

5. Never use "Larger than, Smaller than" or similar comparisons, (Increases, Decreases, Minimum, Maximum) as possible answers. Usually the alternate answers are not probable, and it gets down to a guessing game with a 50/50 chance of success. For example
"One milliwatt is:
(a) larger than one microwatt.
(b) smaller than one microwatt.
(c) larger than one watt.
(d) equal to one millionth of a watt."
or
"In a series resonant LC circuit the:
(a) current is minimum.
(b) voltage across C is minimum.
(c) impedance is maximum.
(d) current is maximum."
or
"Tropospheric propagation is normally encountered:
(a) below 3 MHz.
(b) below 30 MHz.
(c) above 30 MHz.
(d) on all AM bands."

The above problems may be avoided by what I call "the double bunger". For example:
"When a resistor is connected in parallel with a parallel LC resonant circuit, the effect of bandwidth and Q respectively will be:

	Bandwidth	Q
(a)	increase	decrease
(b)	decrease	increase
(c)	increase	increase
(d)	decrease	increase

6. Don't provide responses that can be eliminated by logic.
"A semiconductor diode will conduct if the:
(a) anode is negative with respect to the cathode.
(b) cathode is positive with respect to the anode.
(c) cathode is 0.1 volts more positive than the anode.
(d) anode is more positive than the cathode."
(a and b state the same thing, so both must be wrong. If c is correct, then b is also correct. Thus, d is the only possible right answer).

Another problem with this question is that, technically there is no right answer. Assuming a silicon diode, the forward voltage must be above 600 mV for useful conduction.

7. Where a question requires a candidate to identify a circuit symbol, the symbol should be as set out by the Australian Standards Association. It is not fair to expect candidates to recognise unofficial symbols.

This symbol appeared in a recent examination.

The correct symbol for a Zener diode is:

Voltage regulator diode or reference diode Zener.

Noel Jackson VK3CNJ
(Retired Teacher at RMIT)
25 Edenhope Street
Kilsyth, Vic. 3137

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OWNING AN FT-102

I read the article in the March 1988 issue with great interest. I feel I should record my own short story, as an FT-102 owner.

I purchased my FT-102 in November 1982, and since that time, it has had, on average, a good daily "thrashing" on DX/CW, at full output power. I have never experienced any trouble whatsoever with it.

Yours sincerely,
V H A McBratney VK5YD
PO Box 151
Blackwood, SA. 5051

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DO IT! — BE AN AMATEUR

It is hard to believe all the nonsense that has been written lately is "fair dinkum". Do people join a cricket club and complain because there is no net, as in tennis? Or want the rules changed to provide a string on the ball to save all that running about?

Yet people are joining, or trying to join in amateur radio, and attempting to change it to something more like CB!

Surely they must realise that the amateur service has been built up over the years by technically minded folks, practical folks, intelligent folks! It is not just a cheap "talk show" — buy a rig and talk. Businesses wishing to sell amateur equipment would have us believing their black boxes to be the essential stepping stone to talk, talk, talk — the licence being the only hindrance — and guess who is pressing for more sales — more money — greed. That is about the size of it! Greed by business people and greed by the less technically-minded, less practical members of society.

To sum up, if you have a genuine interest in radio theory and practice, the desire to build up some equipment and make it work — better and better as your experience teaches you, then go to it — tackle the Novice level and work your way up to the Full Call. Never mind if you do not achieve the final goal — you are doing it, being an amateur — every day more technical, more practical and more intelligent. Have a go, or try another pursuit, like bowls or even an amateur theatre group — there's plenty of talking there!

Yours faithfully,
K G Griffiths VK2BGG
[illegible]
Wauchope, NSW. 2446

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OLD QSL CARDS

I was most interested to see a reproduction of an old QSL card published in the March issue of AR, namely "OA5WS"

When I had occasion to hear this station back in the 1930s, the call sign was then VK5WS, and it was owned and operated by a very interesting personality by the name of Vic Coombe, whose original call signs were A2WS and OA5WS.

Vic had been bedridden for some years and operated his equipment on the 200 metre band, from his bedroom. He was regularly heard of on a Sunday morning dispensing cheer and recorded music, always preceded by melodious sounds emanating from his bird aviaries at the rear of his house. Kookaburras were a specialty.

One night each week, Vic could be heard in a program broadcast by the ABC station, 5CL, in which he would talk to some hundreds of boys in a club which was formed by the station, 5CL, of which Vic was Patron. He always began his broadcast with the greeting "Is everybody happy? That's the jolly idea!"

I think my old friend, VK5DC, who was around in those days, would have nostalgic memories of the above happenings, and perhaps could recall more of the era I have described. How about it, Shep?

John G Lyons VK2NDR
56 Bowral Road
Mittagong, NSW. 2575

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JACKET MAKER PROGRAM
February, page 12

Despite all precautions and careful checking, gremlins did find their way into my program.

For those of you who had the courage to type the program in yourselves, the following line should be altered:

1880 IFCH = 6THENC = 80:RETURN

For those who sent for the program

If you have a disk monitor program such as DISKMON or DISK DOCTOR, alter Byte 88 on the 34th block of the program from 58 to 50 and re-write the block to disk.

If you have a ML monitor program, alter $2973 from 58 to 50 and re-save the program. (Start add $0801 - End add $2CB7).

The error is only evident if you have more programs than will list on the jacket.

Yours in amateur radio
Bob Richards VK7NRR
14 Kinross Road
Invermay, Tas. 7248

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MORSE CODE — TO BE OR NOT TO BE

The anti-CW lobby wants WIA/DOTC right now, unilaterally, to discard the Morse requirement for

the NAOCP and AOCP Approximately nine years ago, against URE protests (URE is the equivalent of WIA), Spain took this step. The EA population was then roughly that of VK, so the Spanish experiment can be taken as a precedent.

Amateur radio licenses doubled in three years from 15000 to 30000 — the theory requirements appeared to be somewhat lower than ours — however, the number of new members joining the URE did not come up to expectations, many existing URE members resigned and formed a 'splinter' group of mostly A1 moders with good technical and operating skills.

The end results were that the URE found itself with more operators but operating standards fell noticeably, the newly-formed 'splinter' society became a vocal outlet against the URE's shortcomings and many countries refused to recognise the Spanish EA licence. This cause various problems including those of reciprocal agreements. The worst blow of all was the attitude of certain groups of amateurs in other countries: they rubbished EAs on air, accusing them of being 'pseudos', second class operators, even 'trash'. This downgrading of recognition by their peers was the last straw. The Morse code requirement has now been reinstated in Spain and three classes of licences are issued.

Why did Spain make this hasty, foolish unilateral decision? Most private opinions were that URE objections were purely cosmetic and the Government's decision was influenced by a vocal but largely ignorant minority group. History never repeats itself exactly, so the Spanish misadventure must not be taken as a model for what might happen here in Australia, but the sequence of events may be very similar should the WIA agree to unilaterally discard the Morse code requirement. There is certain to be a drop in membership and a new society formed as interest in A1 mode is definitely greater than the anti-CW lobby understands. Polls show that some 60 to 80 percent of amateurs in the world use it to advantage.

Under present circumstances a reasoned definitive argument against Morse is difficult to sustain. The anti-CWers claim that the effort needed to obtain code proficiency is not worth the final reward would be rejected by every proficient A1 moder. The lobby falls back on words such as primitive, obsolete, antiquated — all meaningless in themselves, unless clearly qualified.

Each mode has its own particular value and virtue. A phone QSO out-performs CW in speed and intimacy — but only marginally, as can be proved by studying the results of big contests where SSB and CW scores often compete for the top placings. Popular opinion is that it is easier to talk for an hour than it is to 'punch a key' for the same period: another misconception. A well-balanced electronic keyer almost goes on its own and, at a relaxed speed, creates neither strain nor fatigue.

All aspects considered, CW is superior rather than inferior to other modes. It is simple to comprehend, is highly accurate (known as the Immaculate Reception) and has no equal when the circuit is critical. It is the sharpest of NB modes, usually around 200 cycles, which is why the RTTY operators prefer to work with it rather than with SSB. TVI is minimal and weaker signals are more easily picked out of the big pile-ups. It is the most economical way to transmit and no great QRO is needed. On most days, CW activity equals that of SSB — sometimes more so! CW creates a bilingual communication system for those who also use phone and, because of speech and language problems, more than 10 0000 amateurs are forced to depend on A1 mode entirely. If AR's code of ethics is really what it purports to be, the activities of this latter already deprived group should never be further down-graded.

Morse code and wireless operators are beginning to be discarded by some (only some) commercial services, mainly marine where the prime aim is to reduce overhead costs. Anti-A1ers try to use this fact to argue that amateur radio should do likewise. The argument is specious. Commercial radio exists primarily for monetary profit — amateur radio's aim is to socialise. Marine services have set sea routes with determined land stations and, when voice is used, the language spoken is known. Amateur Radio operation is entirely different; the majority of QSOs are truly international and a 'CQ' is usually sent to anyone, anywhere.

The 'Z-calls' are directing their frustrations against the wrong target. They may have a valid argument for use of some part of the SSB spectrum, but no argument for abolishing CW.

Regarding DOTC devolvement, if Morse examinations are to be conducted by private groups, the opportunity exists for less stringent Morse testing without down-grading in any way. An opportunity such as this should not be missed. The actual modifications are too detailed to outline here, but they would permit a greater number of errors, a shorter test period and allow the examinee to choose the best of three runs with time to correct his mistakes. This might appear to downgrade the Morse examination but precedent and past experience with the final product show it will not. The modified procedure would give the examinee more confidence (a very vital factor) and allow those who have failed previously to obtain a pass.

I am on air daily. For the past three months I have recorded all the new VK calls appearing on the bands and am amazed at the number which is steadily growing!

Alan Shawsmith VK4SS
35 Whynot Street
West End, Qld. 4101

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PRINTERS DEVIL

Thank you for publishing my article on the M100 Speed Controller. Unfortunately, the "printers devil" has omitted two resistors from the circuit diagram.

There should be a 47k resistor in series with the moving arm of the meter adjustment potentiometer.

There should be a 220k resistor between the emitter of the 2N297 and the inverting input of the operational amplifier preceding it. The circuit shows a short circuit for this which would be quite disastrous.

Morris Odell VK3DOC
84 Hill Road
North Balwyn, Vic. 3104

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PERSONALISED LICENCE PLATES FOR AMATEURS

For many years, American radio amateurs, and more recently amateurs in some other overseas countries, have enjoyed the privilege of having their car licence plates display the owner's call sign.

For some time, several States and recently also Victoria allow people to have personalised licence plates with various combinations of letters and numbers. On applying for a VK3 plate however, I was informed that such a combination was not [illegible]

I feel that as a Bicentennial goodwill gesture the Government should reconsider the use of VK plates nationwide, or at least in the States where personalised plates are already in use. It would be interesting to see how many amateurs would be concerned with this issue. From inquiries in the Geelong area, it appears to be a very popular topic.

If enough people are interested it may be possible to tackle the matter as a Federal WIA issue. In the meantime, I would be happy to receive brief supporting correspondence to start the ball rolling. As I am not a lawyer, some legal advice may be needed in the future.

Keith Vriens VK3AFI
204 Myers Street
Geelong, Vic. 3220

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NOW, I'M AN AMATEUR TOO!

Just over a year ago I went to a friends house on a social visit and discovered that he was an amateur radio operator.

I spent some time with him in his shack and an interest in radio, that I had as a child, was rekindled.

When I was about 10 years old, I built a crystal set and a battery operated single valve radio using round powder cleanser containers to wind the inductors on.

With this interest renewed, I bought myself a secondhand unit, acquired a set of Novice Notes and began studying theory and regulations. I also practiced CW.

My heartfelt thanks goes out to all of the operators on the VK2BWI practice net for all their efforts. Without them, the task of learning CW would have been much more difficult. Also, after I received my novice call, the advice and assistance received from these operators greatly assisted me in passing the 10 words-per-minute examinations.

I was able to pass the novice examinations on the first attempt and have had nothing but enjoyment out of the hobby since. I have made friends around this great country and I correspond with some of my DX contacts.

I have found that fellow operators will go out of their way to be of assistance when a problem arises. I was having problems getting a home-brew ATU to function correctly. I mentioned it to one of my radio friends, "Put it on a train and send it up to me" he said. "I'll have a look at it and see what can be done." We have never met face to face, but a friendship has developed through our radio contact.

Aside from the experimentation that is carried out, to my way of thinking amateur radio is about friendship and helping others. This brings me to the point of CW qualifications for radio operators.

I have read arguments for and against the CW requirement for the AOCP and NAOCP and my vote must go to its retention.

I do not use CW very often, most of my contacts are on SSB, but I still listen to the Morse Broadcasts to keep in touch.

I believe that as licensed radio operators we are morally obligated to be of assistance to the authorities and the public in times of emergencies, whether the emergency be either national or international in nature. And, as we know, the vagaries of propagation may make SSB operation all but impossible whilst a CW signal will still get through. Keep the CW requisite, it may someday save someones life.

As far as novices on other bands are concerned, I do not personally require any more band space at this time. I fully enjoy what I have. My yard is not large enough to erect any more antennas (my wife would object anyway), and I do not want to go to the expense of purchasing any more equipment until I pass my Full Call. I am content with what I have, and quite a few novices that I have spoken to are content too!

Ray Coleman VKMBW
18 Suttor Street
Bathurst, NSW. 2795

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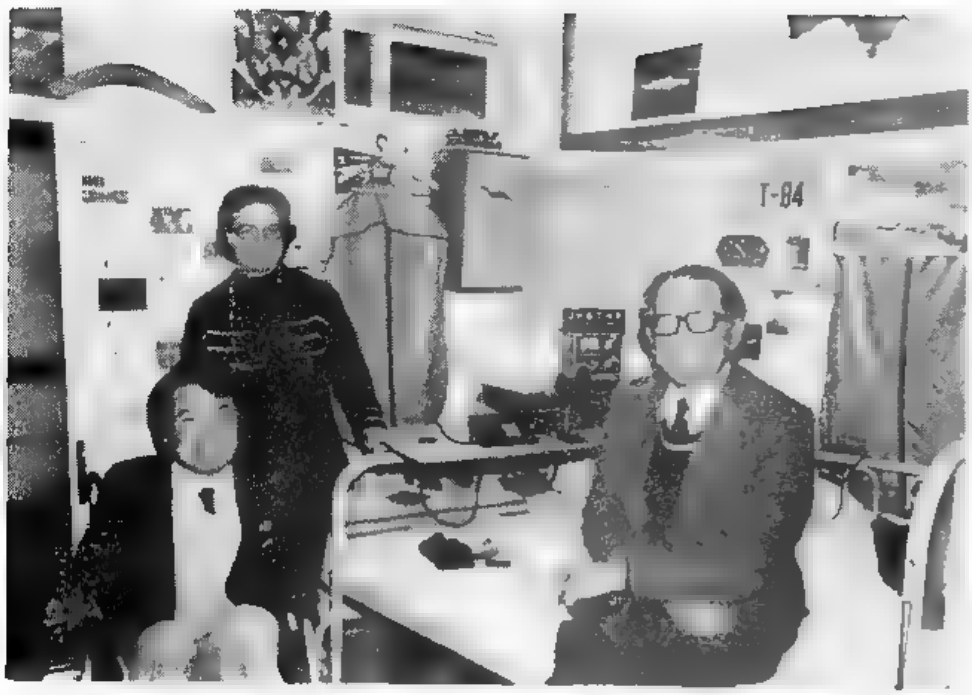
Des VK3CO, and the late Chitary Moriyama.



PACIFIC RADIO CLUB

I was shocked to learn of the death of my friend, Chitary JH6THP, from Kawatana, Japan.

I first met Chitary on 15 metres many years ago and had the pleasure of meeting him in person during a visit to Japan in 1975. Chitary was a great organiser and formed the Pacific Radio Club, also a club in the hospital where he was a resident. Bill VK2WT was the first member of this club whilst I had the honour of becoming the second.

Chitary was a wonderful man with a remarkable spirit. Through his efforts and enthusiasm he was able to fulfill one of his dreams several years ago — visit Australia.

The photograph shows Chitary's shack in his hospital room.

Yours faithfully,

[redacted]
16 Clydesdale Court
Mooroopna, Vic. 3629

Magazine Review

Roy Hartkopf VK3AOH
34 Toolangi Road, Alphington, Vic. 3087

G — General
C — Constructional
P — Practical without detailed constructional information
T — Theoretical
N — Of particular interest to the Novice
X — Computer program

HAM RADIO — November 1987. Annual receiver issue (G). Receiver buzz words (N). Low noise receiver techniques (G). Tomorrow's receivers (G). Voltage comparators (G N). RF Volt meter (C).

QST — January 1988. Direct conversion SSB receiver (C). 432 MHz Yagis (C). VFO and accessories (C). Measurements (G N).

SHORT WAVE MAGAZINE — January 1988. General information for the shortwave listener. Broadcast times and frequencies etc (G).

RADIO COMMUNICATION — February 1988. All band HF mobile antenna (C). Kite borne antennas (P). Annual index for Volume 63.

73 MAGAZINE — January 1988. Special DX issue. W67PAX games operation (G). Propagation prediction program (X). Lists of countries and general DX information. Computerised readout for the FRG-7 (P X).

QST — FEBRUARY 1988. Receiver using two ICs (N). Selcall system (P). Simple power supply (N). ASCII — Braille decoder for the blind (G). QRP transmitter design (P N).

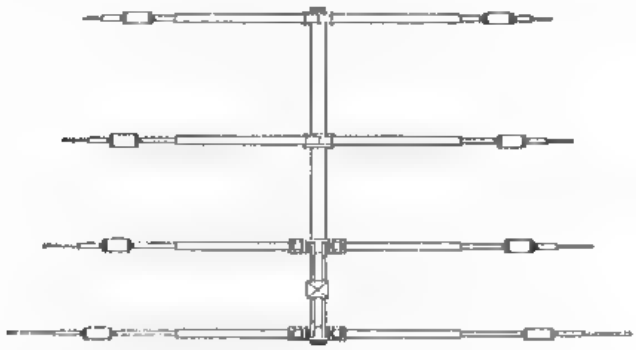
HAM RADIO — January 1988. Battery backed power supply (P). Uses for television tuners (P). QSO "beeper" (P). Frequency drift (G N).

SYDNEY — MELBOURNE — BRISBANE

Made in Australia TET-EMTRON ANTENNAS

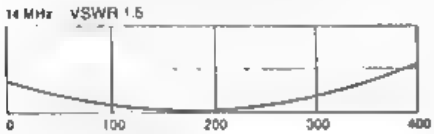
Dr MAC TANIGUCHI of TET Japan has now joined EMTRON INDUSTRIES and improved his already famous "phase-lead" matching system based on the "HB9CV" concept. This new matching system provides an increase in gain, roughly comparable to adding another element to the antenna, while significantly improving the front to back ratio. The performance exceeds even conventional YAGI-UDA design and these new TET-EMTRON multiband beams exhibit extremely flat VSWR over a wide frequency range.

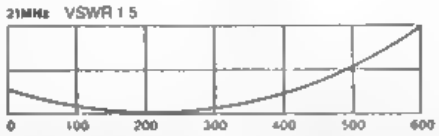
Our new antenna factory "TET-EMTRON" a division of EMONA ELECTRONICS is now producing a range of antennas aiming specially at the export markets of Japan, U.S.A and Europe.



SPECIFICATIONS:

	HB33DX	HB43DX
Frequency	14/21/28 MHz	14/21/28
No of Elements	3/3/3	4/4/4
Gain (dBd)	8.5/8.7/8.3	9.4/9.5/9.8
F/B Ratio (dB)	22/24/21.5	24/24.7/22
VSWR	1.5 or better	1.5 or better
Power Rating	2 kW	2 kW
Impedance (ohm)	50	50
Element Length (metre)	6.25m	6.25m
Boom Length (metre)	4.0m	6.0m
Turning Radius (metre)	4.54m	5.1m
Wind Surface Area (m²)	0.58m²	0.74m²
Wind Load (EIA STD 80 MPH)	56.7 kg	72.7 kg
Weight (kg)	15 kg	19.2 kg
Price	$449	$549





NEW 1KW EMTRON TUNER
EAT-1000A Only $549

NEW 300W EMTRON TUNER
EAT-300A Only $349

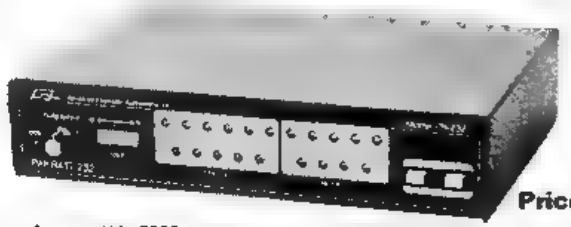
OVER 1000 FAMOUS EAT-300 SOLD

JOIN THE PACKET REVOLUTION!

New PK-232 Breakthrough

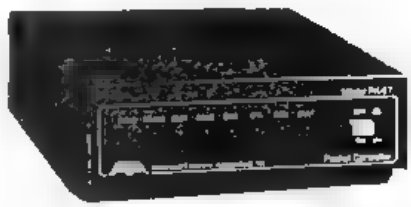
A new software enhancement makes the AEA PK-232 the only amateur data controller to offer six transmit/receive modes in a single unit

★ Morse Code ★ Baudot (RTTY) ★ ASCII
★ AMTOR ★ Packet ★ Weather FAX



WITH FAX
Price $699

An incredible 2000 percent per year growth in the number of PACKET RADIO OPERATORS has been recorded in the USA. This packet revolution is fast coming to Australia and EMTRONICS is ready to serve you!
NEW PACKRATT PK 232 Morse Baudot ASCII AMTOR, and packet data controller in stock now! This six mode machine goes with any RS232 computer or terminal. Call for full specs.



PK-87™ PACKET CONTROLLER $399

The PK 87 is not just another copy it's much more. With all the packet program features of the Multi-mode PK 232 the PK 87 is an economical new TNC designed to bring you enhanced, completely compatible packet software plus new hardware features for improved packet operation.

Software Enhancements

★ AEA's exclusive MBX Mailbox Monitor command lets you read and save received data without confusing headers, callsigns or repeats ★ New commands let you restrict the use of your station for connects and digipeater functions ★ Host mode for improved terminal program operation and development of specialized programs and applications ★ Compatible with existing WORLI WA7MBL PBBS Mailbox/Gateway programs with complete software command for remote selection of link rate modem tone etc ★ Autobaud routines for terminal data rates from 300 to 9600 baud programmable down to 45 baud) and software control to set on-air data rates from 45 to 9600 baud. While the PK 87 can be used for HF operation AEA recommends the PM-1 packet modem as a high performance front end for best results in HF packet service. Only the new AEA PK 87 has all these features. Contact your local AEA dealer and join the packet revolution today by ordering the new PK 87.

Hardware Enhancements

★ Eight front panel status indicators show Converse Transparent and Command modes, Multiple Connects, Data Carrier Detect, Push to Talk Status and Connect ★ High sensitivity (5 millivolts RMS), and dynamic range from 5 to 770 millivolts RMS ★ Rear panel AFSK output level adjustment from 5 to 100 millivolts RMS ★ One minute hardware watchdog timer provides system security in unattended VHF/UHF PBBS/Mailbox and digipeater operation ★ Modem disconnect circuits guarantee compatibility with future high speed modem applications and developments ★ Zilog 8530 SCC provides dependable hardware HDLC for higher speeds and AMD 7910 for reliable modem performance without calibration.

EMTRONICS

THE AUSTRALIAN RADIO COMMUNICATION CENTRE!

Silent Key

It is with deep regret we record the passing of

MR ARTHUR S HECKENBURG VK2AHL

Obituaries

GILBERT CHARLES SHERRIN-MOODY VK4AK

Gil Moody VK4AK, Ex-VK3ZR 1934 — 1970

Gil passed away suddenly at his home in Paddington, Brisbane on March 15, 1988 aged 73 years

Gil was born in Hobart, and worked at Channel 9, Melbourne in the early days of television; and later at Channel 2, Brisbane before his retirement.

A much travelled and knowledgeable gentleman, Gil was one of our top DX men, and always willing to pass on the latest DXpedition information.

I consider it an honour to have been a close, and long-time friend of Gil. He will be sadly missed by his wife, Joan, family and many mates far and wide.

Fred Lubach VK4RF

er

GEOFFREY CAMPBELL VK2ZQC

Geoff Campbell was a quiet, unassuming person who over his all-too-short lifetime had been involved in a diverse range of interests of which flying and electronics were his twin passions. His considerable technical skills were applied to help many organisations and people over the years. Geoff's ability to fix just about anything was legendary amongst those who knew him

He passed away quietly at home in the arms of his loving parents. It was his 48th birthday . . December 17, 1987. His brave and unyielding nine month battle against cancer was over. His life had been full of all the things that were his challenge and his achievement.

From around the age of 10 Geoff was enthralled with flying and radio. He flew solo gliders at a very young age and went on to fly various powered aircraft at Camden aerodrome . . . one of his favourite places. His interest in model aeroplanes ran parallel to real flying.

Geoff lived all his life in Drummoyne, attended Drummoyne Primary School and then Ashfield Technical High He had little patience or interest in the written word for it was practical things that begged his involvement. His entire working life was spent with Telecom . . . some 33 years after starting with the PMG, working at the Sydenham Workshops and, more recently, in the Telecom Materials Testing section at the AWA Ashfield manufacturing plant. His working career was driven by unshakable personal and professional integrity along with a refusal to subscribe to the "near enough is good enough" approach.

While his father gave Geoff many of his own skills, particularly in woodworking, it was his uncle that brought the enthusiast side of radio communication into his life. So, in 1950, Geoff was able to tap the world of amateur radio through VK2IF. This was the call sign of the "R-9 Radio Club" created in 1934 by C E Winch. Crystal sets and one-valve home-built radios were their pastime. Little did they realise then what a Pandora's box would open onto the field of radio and electronics as the decades rolled by. Fortunately, Geoff was able to live through a time of incredible technical advancement which impacted across all of his many interests.

Geoff's more recent radio activities included communications set up on the *Dick Smith Explorer* and many hours devoted to the establishment of radio station facilities at the Museum of Applied Arts and Sciences. In addition, he carried out experimental activities in the UHF and GHz bands.

Geoff is survived by his parents, brother and sister and grandmother. The many friends and organisations who were fortunate in his acquaintance are deeply saddened by such a productive, yet humble, life taken from us all too soon.

[redacted]

er

SID BRYANT VK3CI

On February 13, 1988, the amateur radio fraternity lost a good and valued member when Sid passed away in the Nagamble hospital, aged 87 years.

Sid, a personal friend, was well-known in the Nagambie area for his television service business and later for his activities on two-metres FM and sideband.

In the 1940s, Sid together with Allan VK3UI, was one of the first to work VK7 on two-metres FM from the Foster area. Sid, on recalling this incident, always remarked that the first words uttered from the VK3 end were "you . . . . . beaut "

Sid had been on the air from 1947 and also held the call of VK5SB for two years when in Adelaide some years ago.

In his early years, Sid raced motor-bikes on the "cinders" and his wife still has a scrap book of cutting from the newspapers of that era, portraying his exploits.

His favourite band was six metres and he had just completed a six metre beam in August 1987 when he broke his leg and was hospitalised

Sid's shack and house were always open to visitors who invariably were treated to scones and tea. They were sent on their way with a piece of radio equipment and a bag of lemons.

Sid is survived by his wife Ivy (Bobbie), and daughter Jan, to whom his amateur friends extend their deepest sympathy.

Bill Currie VK3AWC

er

JOHN FRANCIS O'DEA VK5KOP

John O'Dea VK5KOP, passed away after a long illness aged 54.

John was born in Streaky Bay, South Australia, in 1934. He was educated in Adelaide and joined the railways as an apprentice motor-fitter in 1949. In his time as an apprentice he was called-up for nine months national service, spending that time in the Navy.

John joined the St John Ambulance in 1951 after taking a first aid course with them. Whilst a member of the Prospect Ambulance division, part of John's duties involved manning the police ambulance. From there he developed an interest in police work and joined the police force as

a motor mechanic, took a 12-week adult training course and became a uniformed policeman with the Unley division.

He then spent years on country duty in the State's north, working from Port Augusta, Oodnadatta and Maree. It was in Port Augusta, in 1959, that he married his wife, Barbara

During that time he established himself as a firm, but fair policeman and a community minded citizen becoming involved with many community groups such as the SES, fire brigade, St John Ambulance, Victor Harbour Yacht Club, football tribunal and Scouting. John's long and dedicated community service was recognised through awards and medals.

Due to a severe stroke at the age of 47 John was forced to retire. He did not recover well enough to upgrade his amateur licence.

To his wife Barbara and their three children we extend our deepest sympathy.

Compiled from the *Victor Harbour Times* and contributed by Bill Crawford VK5XB

JOHN MCCONNELL VK3RV

April 17, 1915 — February 8, 1988

John, Jack or "Mac" to his radio friends, was first licenced as a radio amateur in 1936.

He served an apprenticeship with the Melbourne City Council Electric Supply Department (MCCESD) where he worked for many years in the Meter and Standards Laboratory, followed by a period at one of the Council's Rotary Converter substations. Later, he was involved in customer relations and advice at the Melbourne Town Hall.

In 1940, he married Nonha and was father to five children

Between 1941 and 1945, he lectured at the Royal Melbourne Institute of Technology (RMIT) on Radar and Communication maintenance.

During the 1950s he worked with the Utah Company constructing the Eildon Reservoir where he was involved with communications.

Beside his family, his next greatest love was amateur radio. However, in the early years of his hobby he had to make the best he could with components taken from old radio receivers and surplus Army equipment. Even until the early 70s Mac's station was entirely home made — including the power transformers

Mac had a great sense of humour.

During the 60s, commercial amateur equipment was becoming freely available in many countries and brand names such as Swan, Drake and similar 'bird-type" brands were frequenting the amateur bands — especially in the USA.

One day, whilst working an American station with a recently constructed "junk box" low powered sideband transceiver, a good report was received. After telling Mac about his "super" Swan transceiver, the American inquired as to what "beaut" piece of equipment was being used in Melbourne.

Quick-as-a-flash, and with a twinkle in his eye, Mac replied, "Oh, it's a Gander — mark

you!" to which the American allegedly said; "I haven't heard about that make before — it must be good because your signal is so good — I must inquire about it at the local radio store tomorrow!"

Many of us have had the pleasure of working Mac on his "Gander" — such was his ability to make the best out of any situation.

Mac returned to the MCCESD after completing work at Eildon. He retired from the Council in 1978 and was able to travel overseas with his wife Nonha on three occasions. There he met many of his radio friends and made many new ones!

Closer to home, Mac was an active member of the community. He was always helping others whenever he could. He was involved with Meals-On-Wheels and was a member of the Moorabbin Radio Club and the WIA.

Of recent years he was a very active member of the RAOTC where he held the position of Broadcast Net Controller for the Eastern States.

Vale John, loving husband, father and friend.

—Peter Wolfenden VK3KAU

ar

RAYMOND LESLIE NIELSEN VK4CRN

Townsville amateurs were saddened by the recent passing of Ray Nielsen VK4CRN. A large number of radio club members were among the almost capacity congregation who gathered at the Woongarra Crematorium for the funeral service. The service was conducted by Barry Hill VK4KCD and a short address was given by Club President, Evelyn Bahr VK4EQ.

Ray had been restricted in his movements for a number of years, and confined to a wheel chair for the past two years. He was a relative newcomer to amateur radio, which helped to provide a link to the outside world. Rays previous call signs were VK4MUN and VK4JUA.

Ray was always listening on the amateur bands, ready for a chat or to help someone in trouble. He assisted quite a few local amateurs to increase their proficiency in Morse code with his on-air and in-house practice sessions.

He also assisted in the preparations for the last two North Queensland Conventions which were hosted by the Townsville Amateur Radio Club.

To his wife Margaret VK4JMN and sons, Rodney and Kevin VK4MUK, we extend our deepest sympathy.

—Peter Renton VK4PV on behalf of the Townsville Amateur Radio Club

ar

PHIL LEVENSPIEL VK2TX

With regret we announce the death of Phil Levenspiel VK2TX, on December 5, 1987, aged 83. Deepest sympathy is extended to his wife Rene and sons, Max, David and Mark.

Phil was one of seven children, London-born of Polish parents. He obtained an Aeronautical Engineering Certificate and migrated to Australia in 1927. There was no work in the aviation field available in Newcastle at the time so he transferred to the automotive field. He managed a local garage at Wyong, which later became Wyong Motors Holden.

In 1962, he handed the business over to his son, Max (now VK2CDF), and retired.

Phil was a member of the Wyong Masonic Lodge, Rotary Club (he was a past-president and Paul Harris Fellow) and Probus Club.

He became an amateur at Wyong in 1930 and had a close association with Owen Chapman VK2OC, Geoff Warner VK3CK and Jeff Thompson VK2XP. He was an excellent mechanic, turning out impressive items on his workshop machines: hand Morse keys, bug keys, condenser microphones and variable condensers. More recently, upon losing his hearing, he turned his activities from amateur radio to mechanical clock making (he made 13 masterpieces for his children and grandchildren).

Phil was a clever organiser and, with Owen's help, staged the 1931 and 1932 Wyong Field Days at the Wyong Showground. He was one of the early experimenters on five metres about that time.

In 1930-31, he journeyed by car to Meekatharra (Western Australia) with Reverend Stan Collard, to the Methodist Mission Station. Phil, the radio operator for the trip, provided communications using an OV1 receiver and Hartley oscillator with Telefunken modulation transmitter.

Phil was a keen supporter of the Central Coast Amateur Radio Club, in Gosford, from its inception in 1956 to the present day.

Upon his retirement in 1962, Phil built a new home on a hilltop at Ourimbah, which overlooked the Tuggerah Lakes. He then proceeded to construct a monster four element triband quad antenna. Mechanical construction was no problem and DX was readily available.

We will miss Phil very much.

—Lindsay Douglas VK2ON

Tuning a Sussor movement clock in 1986.

Crossing the Nullabor en route to Meekathara in 1931.

DEADLINE

All copy for inclusion in the **July 1988** issue of *Amateur Radio*, including regular columns and Hamads, must arrive at **PO Box 300, Caulfield South, Vic. 3162**, at the latest, by **9 am, May 23, 1988.**

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write ***each*** on a separate sheet of paper, and include all details; eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. ***Please do not use scraps of paper.***

- Please remember your STD code with telephone numbers
- Eight lines free to all WIA members. $9.00 per 10 words minimum for non-members
- Copy in typescript, or block letters — double-spaced to ***Box 300, Caulfield South, Vic. 3162***
- Repeats may be charged at full rates
- QTHR means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

$22.50 for four lines, plus $2.00 per line (or part thereof)

Minimum charge — $22.50 pre-payable

Copy is required by the Deadline as indicated on page 1 of each issue.

TRADE ADS

AMIDON FERROMAGNETIC CORES: Large range for all receiver and Transmitting Applications. For data and price list send 105 x 220 mm SASE to: **RJ & US IMPORTS,** Box 157, Moridale, NSW. 2223. (No inquiries at office please . . . 11 Macken Street, Oatley). Agencies at: Geoff Wood Electronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Willis Trading Co, Perth, WA. Electronic Components, Fishwick, Plaza, ACT.

COMPONENTS: Wide range of parts for receiver, transmitter and other electronic equipment. Semiconductors, valve, plate bypass capacitors, coaxial connectors and many more. Mail inquiries welcome. Sorry, no catalogue available. D Dauner Electronic Sales, 51 Georges Crescent, Georges Hall, NSW. 2196. Telephone: (02) 724 6982.

EQUIPMENT COVERS: hand-made to suit your radio, computer, printer. No more dust or static problems with cotton dust covers made to fit your equipment. Send SAE for prices and ordering information to Collins & Duncombe, 15 Celebes Street, East Maitland, NSW. 2323.

VALVES: ask for our special prices, selling 3-500Z at $298 plus tax. Contact us for data and more prices.

BROAD BAND ANTENNA 50 MHz-1.3 GHz 200 watt — $298 plus tax.

UHF BROAD BAND ANTENNAS 470-830 MHz, MX43 16 dB gain (also usable for 70 cm band) — $42.60 plus tax.

E.D.S. 27 BUCKLEY ST, MARRICKVILLE NSW 2204, PH: 519 7007

EXCHANGE — NSW

MICROBEE 32K COMPUTER: Green monitor, tape recorder, Wordbee, Editor-Assembler, books, mags, programs, tapes, excellent condition. Exchange for solid-state HF transceiver or general coverage receiver. VK2PT, QTHR. Ph: (049) 43 1308.

WANTED — NSW

CIRCUIT: Handbook, service manual for Telequipment D54 oscilloscope. Will pay costs, photocopying, etc. Please send details to Tom VK2ZHR. Ph: (049) 30 7671. Or Craigrannoch Park, New England Highway, Lochinvar, NSW. 2321.

ICOM IC-720A TRANSCEIVER: Also communications receiver with digital readout preferred. Chum VK2CWF, QTHR. Ph: (02) 407 1628.

ICOM IC-730: or Kenwood TS-130S HF transceiver. Prefer original owner VG condition. Contact Norm VK2ENT, C/-PO Wyndham, NSW. 2550 or Ph: (064) 94 2192.

KENWOOD TS-830S: or TS-930S in mint condition. Reasonable price. Lawrie VK2FIF. Ph: (066) 28 0418.

VHF RECEIVER: Older valve type Eddystone, Hallicrafters or ex-disposals. Must be continuous tuning. VK2ZD. Ph: (02) 427 3281.

WANTED — VIC

CIRCUIT DIAGRAM & DETAILS OF EX-RAAF WWII RECEIVER: Type R1155. Photocopies or will photocopy and return. Contact George VK3XEC, QTHR. Ph: (03) 728 3597.

INFORMATION FOR JIL SX-200 SCANNER: Photocopies/circuit diagrams of possible modifications. Eg increase frequency ranges, interfacing to external control, any improvements, etc. Will pay for photocopies and postage by return mail. VK3ZRN, QTHR.

ARRL ANTENNA ANTHOLOGY: Copy of same required. Michael VK3OX. Ph: (059) 82 1652.

KENWOOD MB-100 MOBILE MOUNTING BRACKET: to suit TS-130S. VK3EJR. Ph: (03) 796 8469.

YAESU FT-ONE: Any condition considered. Ian VK3MZ. Ph: (03) 763 0595.

WANTED — QLD

DOW-KEY ANTENNA SWITCH: Relay operated or similar type. Ron Croucher VK4KNZ, 282 Boston Road, Belmont, Qld. 4153. Ph: (07) 390 7762.

EC-10 RECEIVER: Working or not, with circuit diagram. AKG Type-K50 headphones, tunnel diodes. Len VK4JZ, QTHR. Ph: (07) 398 2002 after 6 pm.

HUSTLER 5BTV VERTICAL HF ANTENNA: HF wattmeter. Mic/headphone headset. Details to John VK4SZ, QTHR. Ph: (070) 61 3276.

KENWOOD MA-5 MOBILE ANTENNA SET: David VK4MQC, 27 Dee Street, Mount Morgan, Qld. 4714 or Ph: (079) 38 1263.

KENWOOD TS-130S: or similar HF transceiver for radio club use — reasonable price. John Jones VK4KJJ, PO Box 1030, Gladstone, Qld. 4680. Ph: (079) 72 2930. Gladstone Amateur Radio Club.

FOR SALE — NSW

ANTENNA ROTATOR EMOTATOR 502SAX: $495. Yaesu FP-757HD heavy duty power supply for continuous high power transmit. $450. Yaesu FT-209RH 5 watt output 2 metre transceiver with all accessories. $550. Hidaka VS-33 Triband Yagi antenna for 10, 15, 20 metres. Heavy Duty. $550. All items brand new in carton, purchased as spares, no longer required. Manfred VK2RV, PO Box 120, Vaucluse, NSW. 2030. Ph: (02) 371 8854.

DAIWA AUTOMATIC ANTENNA TUNER: Model CNA-1001 revised version. 500W PEP. Almost unused. Offer. Lawrie VK2FIF. Ph: (066) 28 0418.

LAWN BOWLS: set of 4 Henselite 5 inch super grip (black) bowls. Engraved VK2. Price $75. VK3IS, QTHR. Ph: (03) 707 4965.

KENWOOD TS-520S TRANSCEIVER: Excellent cond, inc mic, user manual. $525. Kenwood AT-230 antenna tuner to suit TS-520S. Excellent cond, inc dummy load for tune up off air. $160. Shure 444D mic. Good quality desk mic. Good cond. $85. Must sell to meet full time Uni expenses as well as support 3 children, wife, & house payments. Will sell separately or the lot for $750 ONO. Contact Glen VK2AGM, QTHR. Ph:(02) 77 8407.

KENWOOD R-820 RECEIVER: Excellent condition. Covers 160, 80, 40, 20, 15 and 10m plus selected shortwave bands. AM, SSB, CW. IF filters installed for 6 kHz, 2.7 kHz, 600 Hz and 300 Hz selectivity. Interconnecting cables to enable transceive operation with TS-520/TS-820. Complete with original packing & manuals. $500 ONO. Kenwood TR-9500 UHF FM, SSB, CW transceiver. Mint condition. 1/10W output. BO-9 station base. Mobile bracket & power cable. Complete with original packing & manuals. $900 ONO. ATN 11 element Yagi with balun. New. Assembled but never used. $100 ONO. VK2ATR. Ph: (049) 59 3748 after business hours.

TELETYPE KSR-33: 110 baud, 7 bit ASCII code. $60. New type cylinder for KSR/ASR33. $8. Multiplexer for KSR/ASR33. $8. Diablo-1600 daisywheel printer. $250. VK2DWO. Ph: (02) 858 1085.

TOWER: Hills two section, crank up to 50 feet. With 20 foot extension, guys, turnbuckles. $200. Model 15 teleprinter. $5. Weller soldering station, needs new element. $40. VK2AZN, QTHR. Ph: (02) 868 3551.

TRANSFORMERS: 2 off — Prim 220/240/260. Sec 500/CT/500 x 175 mA. Sec 5V x 3A. $35 each ONO. 1 off — Prim 220/230/240/260. Sec 310/CT/310 x 170 mA. Sec 5V x 3A. Sec 6.3V x 7.5A. Hermetically sealed. $45 ONO. 1 off — Prim 220/230/240/260. Sec 248/CT/248 x 140 mA. Sec 5V x 3A. Sec 6.3V x 4A. Hermetically sealed. $45 ONO. 1 off — Prim 240V. Sec 115V x 17.39A (2000VA). What offers?
Art VK2AS, QTHR. Ph: (02) 467 1784.

YAESU FT-101E. Good condition, no mods. $400 ONO. VK2EL. Ph: (044) 55 5625.

YAESU FT-101ZD: as new condition including handbook & spare set of valves. $750. Rank RV33 colour video camera with cable, handbook & accessories. Near new condition. $500. Realistic DX-160 comm receiver, good condition. $70. Realistic DX-300 comm receiver, good condition. $150. VK2AOI. Ph: (047) 57 1609.

3 KVA 240V MARKON ALTERNATOR: double bearing free standing unit. Never used. $450. VK2FW. Ph: (063) 65 3410.

FOR SALE — VIC

PRINTER: The Victorian Division has one Sakata 15 inch IBM compatible printer for sale. The unit is unused and comes complete in original carton with the users manual. Asking price $500. For further information contact the President Barry Wilton VK3XV. Ph: (03) 555 6281 between 7.30 & 8.30 pm AH.

YAESU FT-101Z: in immaculate as new condition complete with 600 kHz CW filter, handbook, DC leads (for portable use) & little-used Astatic low & high impedance dynamic desk microphone specially built for SSB. $800. Also ETM-1C-Mos-Keyer (without paddle). $25. Geloso heavy duty microphone desk stand which stretches from 34 cm to 49 cm. This gear has worked more than 200 countries over last 3 years in extremely poor conditions. Roth Jones. Ph: 725 3550.

YAESU HF TRANSCEIVER: (with manual) FT-301 in good working condition with matching FP-301 power supply/speaker & match extern VFO. Orig $1100 now $680. Japanese 4 el 15 m monoband, 10 dB forward gain, weighs 9.5kg. New one over $430 with freight (used only 1 yr). Must sell for $280. American 27 ft high (3 sectioned) galvanised radio tower. Ideal for CB or amateur antenna. With hinged base plate & guy wires. New one with US freight over $840. Now must sell for $350. Ph: (03) 338 5080.

40 PIN EXTENDER BOARD: for servicing FT-107. $35. Contact Gavin VK3HY, QTHR. Ph: (03) 762 6697.

FOR SALE — QLD

COLOUR MONITOR: Kaga RGB Vision 1 with Apple II colour card interface. Monitor is only compatible with IBM-PC, NEC-PC & Apple III machines. $300 ONO. Tower. 33 foot free standing, triangular cross section with approx 3 foot base. Very good condition. $350. Brisbane, Brisbane/Ipswich area. Geoff VK4CET, QTHR. Ph: (077) 73 7179.

BIRD "TERMALINE" DUMMY LOAD/WATTMETER: Model 67C, pwr ranges 100W, 500W, 2500W, measurements calibration 30-500 MHz. Water cooled over 200W. PC, offers around $800. VK4AIZ, QTHR. Ph: (07) 391 5526 (AH) or (07) 227 7224 (BH).

KENWOOD R-1000: 100 kHz — 30 MHz general coverage receiver, 12V/240V, as new. $590 ONO. Yaesu FL DX-2000 HF linear amplifier. $780. Barlow Wadley XCR-30, .5 to 30 MHz, portable gen cov receiver. $230. Kenwood-Trio TX-599 & JR-599 tcvr. $700 ONO. Datong RF speech clipper/processor, fits into any Mic-Line $145. Yaesu FT-501, 400W tcvr, needs repair. $130 ONO. Jeff VK4ABJ. Ph: (079) 28 1105.

KENWOOD TR-7800: 2m FM transceiver. Mint condition. Manual, orig carton. $350. Kenwood TR-8400 UHF FM transceiver. Mint condition. Manual, original carton. $350. Kenwood TS-530S with CW filter. Mint condition, manual, orig carton. $700 ONO. Kenwood VFO-230. Mint condition, orig carton. $200 ONO. VK4SV, QTHR. Ph: (07) 398 6732.

RECEIVER: Drake R2B w/manual. Full coverage capability. 50 kHz IF with steep-sided LC filter. (Excellent for CW). $180. John VK4SZ, QTHR. Ph: (070) 61 3288.

9M HILLS TELEMAST: $25. Rigging kit. $25. Belco AC bridge measures R-C-L. $25. J-beam 70 cm antenna 18 element — Parabeam $30. 2m turnstile antenna. $20. Buyer to collect or carriage extra. Norm VK4ZFO (not QTHR). Ph: (077) 72 5535.

FOR SALE — WA

TOWER: Free standing. To your specifications. Gay VK6ZQ. Ph: (097) 97 1062 for further details.

FOR SALE — TAS

KENWOOD TM-221A: VHF 2m FM mobile, as new, unmarked. 50W output (H) — 10W output (L). $495. Yaesu h/held access. YH-2 headset, PA3 charger adaptor, CSC11 soft leather case. What offers. VK7AN. Ph: (003) 31 7814.

STOLEN EQUIPMENT

The following equipment has been stolen. Any members being offered this equipment or being able to assist with its recovery are requested to contact your WIA Divisional Office, or your local police station.

Stolen from Swansea, NSW — KDK Multi-7 two-metre handheld. Drivers licence 3002JW on base plate. Four channels in use, 6500, 6800, 6900 and 7000. Owner Barry VK2TJB. Reported at Swansea Police Station.

Stolen from Seven Hills, NSW — Icom IC701, serial number 8001039 transceiver. Spare crystal taped under adjustment lid. Icom IC701PS, serial number 7800978 power supply. Owner N Cuppitt. Reported at Seven Hills Police Station.

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